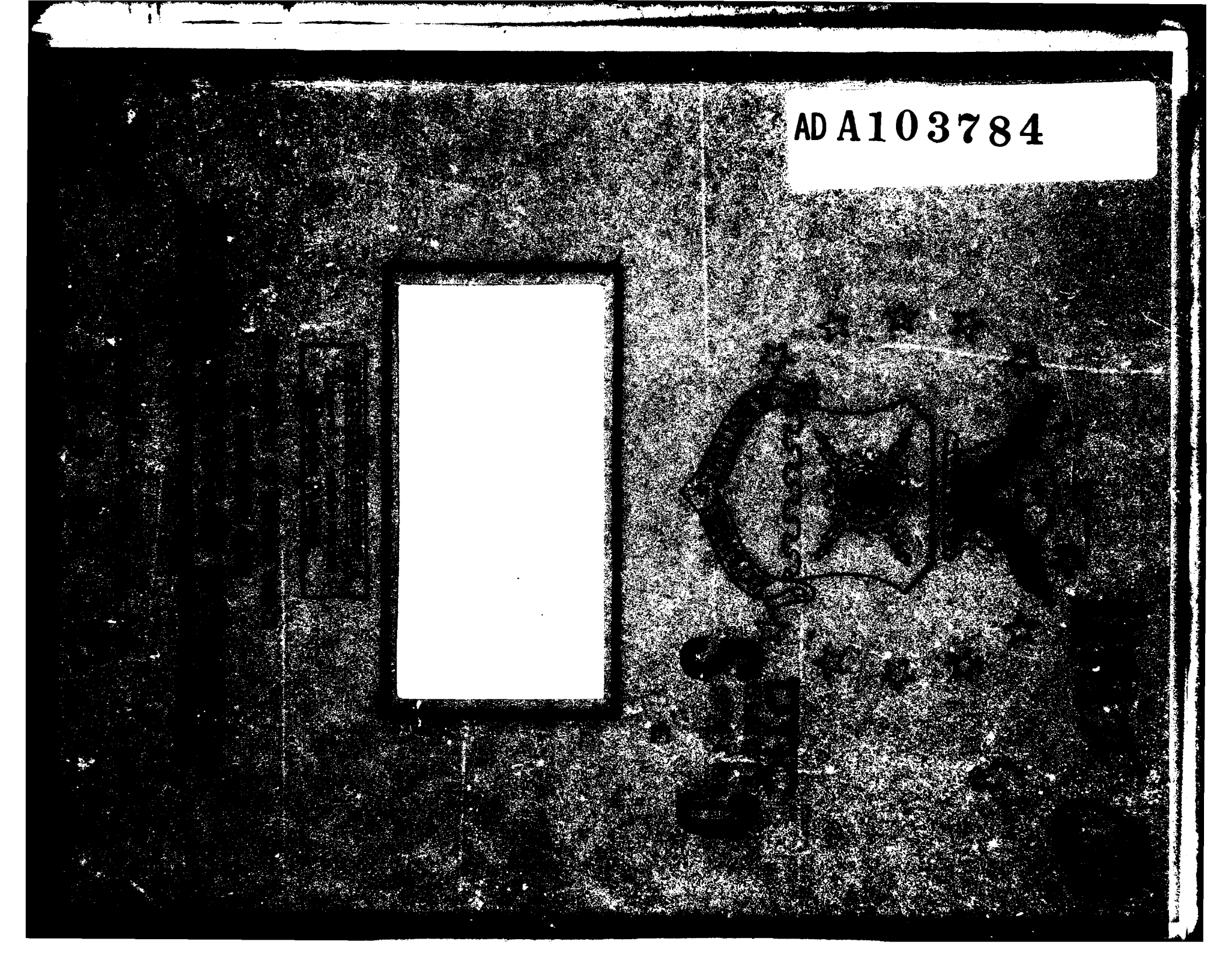
AD-A103 784 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL--ETC F/G 5/9
QUALITY CIRCLES: DETERMINATION OF SIGNIFICANT FACTORS FOR SUCCE--ETC(U)
JUN 81 R E STEVENS, R L MOORE

UNCLASSIFIED AFIT-LSSR-21-81 NL

1 OF 2
AD A103784


AD A103784

LEVEL II (3)

QUALITY CIRCLES: DETERMINATION OF SIGNIFICANT FACTORS FOR SUCCESS AND A GENERAL MODEL FOR IMPLEMENTING A QUALITY CIRCLE PROCESS

Robert L. Moore, Captain, USAF
Robert E. Stevens, Captain, USAF

LSSR 21-81

The contents of the document are technically accurate, and no sensitive items, detrimental ideas, or deleterious information are contained therein. Furthermore, the views expressed in the document are those of the author(s) and do not necessarily reflect the views of the School of Systems and Logistics, the Air University, the Air Training Command, the United States Air Force, or the Department of Defense.

AFIT Control Number LSSR 21-81

AFIT RESEARCH ASSESSMENT

The purpose of this questionnaire is to determine the potential for current and future applications of AFIT thesis research. Please return completed questionnaires to: AFIT/LSH, Wright-Patterson AFB, Ohio 45433.

1. Did this research contribute to a current Air Force project?

   a. Yes b. No

2. Do you believe this research topic is significant enough that it would have been researched (or contracted) by your organization or another agency if AFIT had not researched it?

   a. Yes b. No

3. The benefits of AFIT research can often be expressed by the equivalent value that your agency received by virtue of AFIT performing the research. Can you estimate what this research would have cost if it had been accomplished under contract or if it had been done in-house in terms of manpower and/or dollars?

   a. Man-years _____ $ _____ (Contract).

   b. Man-years _____ $ _____ (In-house).

4. Often it is not possible to attach equivalent dollar values to research, although the results of the research may, in fact, be important. Whether or not you were able to establish an equivalent value for this research (3 above), what is your estimate of its significance?

   a. Highly Significant b. Significant c. Slightly Significant d. Of No Significance

5. Comments:

Accession For	
NTIS GRA&I	X
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A	

Name and Grade

Position

Organization

Location

FOLD DOWN ON OUTSIDE - SEAL WITH TAPE

AFIT/LSH
WRIGHT-PATTERSON AFB OH 45433

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 73236 WASHINGTON D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

AFIT/DAA
Wright-Patterson AFB OH 45433

FOLD IN

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

14

AFIT-

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER: LSSR-21-81	2. GOVT ACCESSION NO.: AD-A103 784 (9)
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle): QUALITY CIRCLES: DETERMINATION OF SIGNIFICANT FACTORS FOR SUCCESS AND A GENERAL MODEL FOR IMPLEMENTING A QUALITY CIRCLE PROCESS - (6)	5. TYPE OF REPORT & PERIOD COVERED: MASTER'S THESIS
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): ROBERT R. STEVENS, CAPTAIN, USAF (10) ROBERT L. MOORE, CAPTAIN, USAF	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS: School of Systems and Logistics Air Force Institute of Technology, WPAFB OH	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS: Department of Communication and Humanities AFIT/LSH, WPAFB OH 45433	12. REPORT DATE: June 1981 (11) 13. NUMBER OF PAGES: 165
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office): (12) 179	15. SECURITY CLASS. (of this report): UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)
Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

Air Force Institute of Technology (ATC)
Wright-Patterson AFB, OH 45433

18. SUPPLEMENTARY NOTES

6 JUL 1981
APPROVED FOR PUBLIC RELEASE AFR 190-17.
FREDRIC C. LYNCH, Major, USAF
Director of Public Affairs

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Quality Circles	Work Ethic
Productivity	Job Enrichment
Participative Management	Goal Setting
Japanese Management	Team Building
Quality	Job Satisfaction

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Thesis Chairman: Virgil R. Rehg, Professor, AFIT/LS

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

012250

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Quality Circles are an organizational development process which deals with deficiencies and problems that plague modern organizations by combining behavioral science concepts with statistical quality control techniques at all levels of the organization. America faces internal obstacles to the widespread application of the more advanced concepts of worker participation in management of the workplace. American managerial philosophy generally considers worker participation of little value at any level in the organization. This research introduces the Quality Circles concept, determined the most significant basic factors inherent within a successful Quality Circles process, and presented a general model for implementing a Quality Circles process. Quality Circles are based on a people-building philosophy which breeds trust, respect, and satisfaction between management and workers. Quality Circles can be applied to any organization, especially the overmanaged public sector. To succeed, management must not be defeated by its own assumptions. We tend to be blind to our own assumptions when we are locked inside them; the Quality Circle concept combats this tendency. Man is limited not so much by his tools, as by his vision...

QUALITY CIRCLES: DETERMINATION OF SIGNIFICANT FACTORS FOR SUCCESS AND A GENERAL MODEL FOR IMPLEMENTING A QUALITY CIRCLE PROCESS

A Thesis

Presented to the Faculty of the School of Systems and Logistics

of the Air Force Institute of Technology

Air University

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Logistics Management

By

Robert L. Moore, BS
Captain, USAF

Robert E. Stevens, BS, MS
Captain, USAF

June 1981

This thesis, written by

Captain Robert L. Moore

and

Captain Robert E. Stevens

has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

DATE: 17 June 1981

Virgil Reilly

COMMITTEE CHAIRMAN

ACKNOWLEDGEMENTS

The authors express their deepest gratitude to those who guided us and contributed their professional expertise to this thesis.

Professor Virgil R. Rehg, Dr John W. Demidovich, Major Russ Lloyd, and Major Thomas Harrington, our thesis committee, proved their devotion to and care for students and they also depict the highest aspirations of the term -- professional. Our study would have been severely diminished without their help.

Tracy L. Hadley, our superb typist, went far beyond providing a mere service. Her speed, accuracy, and willingness to provide that special extra touch significantly reduced the burden and stress upon the authors to such a high degree that our gratitude to her will be timeless. There is no question that she also is a true professional.

To our families, for their unwaivering support, encouragement, and patience throughout the trying times of this entire year.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

This chapter presents a broad perspective of problems and deficiencies which plague modern organizations and give justification to organizational development processes like Quality Circles.

America faces internal obstacles to the widespread application of the more advanced concepts of worker participation in management of the workplace.

> Private and governmental organizations continue to experience problems associated with lack of quality, declining productivity, complacency, poor morale, absenteeism, and employee turnover [58:197]

Managerial philosophy generally considers worker participation of little value at any level in the organization. Because the art of workers participating in management is new in many organizations, top executives lack experience and know-how in dealing with it. Further, the concept is viewed by executives, managers, and supervisors as a threat in terms of conventional power and authority. The problems of managing an increased conflict of ideas and sharing power are frightening to many. An equally serious obstacle to the success of such organizational interventions is impatience to achieve short-term economic gains while dealing with a sensitive new process

that requires long-term commitments. Also, unions are suspicious of these processes and fear that the adversary relationship with management will be weakened, the current problems of collective bargaining will be more complicated, and new problems for their memberships will be imposed. Another obstacle is the shortage of talented third parties who can win the necessary trust and provide the required knowledge to introduce and maintain these various organizational interventions. On a broader scale, participation in such processes threatens the framework of conventional, hierarchial organizations and is seen as topsy-turvy management, which may substitute consensus decision making for one-man rule [187].

However, a number of economic and sociological factors point to the necessity for greater involvement and participation of the worker in the future. The permissive and affluent society has fostered a change in authority roles. Employees have higher expectations and place intelligent limits on the exercise of authority over their lives. The decline in confidence in business, government, education, and other major institutions has affected employees who are members of such organizations. This relative decline in trust and confidence weakens performance on the job [97:337].

Another major sociological problem is less commitment to the work ethic and greater public cynicism which has spread to all classes of workers, from blue-collar to professional

and top executive. Also, the era of rising entitlements has created a widespread feeling that jobs, income, employee benefits, and a higher standard of living are no longer privileges, but rights [11:87]. Employee expectations for participation in decisions affecting their jobs have reached the point at which a majority consider this a right. Among young workers, sixty-two percent expressed this view in 1977 [5:87].

The rising educational level of workers, combined with higher cost per employee, creates an economic necessity to secure a better return on the human investment. Growing automation and advanced technology in both the office and factory increase the complexity of the interaction between man and machine [11:87].

Changes in American social values and mores have been rapid and penetrating over the past decade. In contrast, large organizations are slow to change. Thus, this institutional lag persists and must be corrected to bring organizational life into a more harmonious balance with society and its values. Work is under competitive pressure from other life-styles and interests. The high cost of an educated workforce combined with lagging productivity presents a clear necessity to address the new sociology of work, and to achieve the goal of greater participation and more active involvement of the work force [5:7:347].

Living within a free and open democratic system, the American worker expects conditions within the workplace to be compatible with political and social conditions in other aspects of life. American workers cannot live this double life of flexibility in the community and rigidity in the workplace [T18].

The Industrial Revolution triggered a wave of consumption of natural and man-made resources the ramifications of which have only been addressed within the last few decades. Today, industrialized nations realize that the key to long-term survival is effective and efficient use of resources. To achieve this, the initial thrust of improvement has centered on increased automation and forcing workers to become extentions of machines. Taylor's scientific management experiments focused on work efficiency and physically getting more out of the worker. From purely rational, technological perspectives a good case can be presented for the theory that more efficient jobs will lead to lower labor costs and increased organizational effectiveness. The assumption that the responses of people to their work can be programmed and controlled, grossly underestimates several factors [T09].

The "Taylorization" of our work areas has led to economies in the cost of production, but the major consequence has been an enormous under-utilization of our most

costly and valuable resource -- people [97]. The attitudes of workers have changed since the introduction of scientific management.

> Those who actually produced goods and services in our economy no longer consider boredom, alienation, and lack of dignity as integral and necessary to their working lives [T06:4].

Additionally, scientific management has failed to acknowledge the intensity of the reactions to simplified and routinized work. Absenteeism, turnover, sabotage, and labor disputes are all salient manifestations of worker dissatisfaction with their job, and the attendant costs are staggering [T06:6].

In a business environment of ever advancing complexity, personnel recruiting and training costs represent substantial investments in employees. In conjunction with a high turnover rate, these substantial investments become substantial losses. The implications are that, while in many instances scientific management techniques have brought immediate and visible returns in terms of increased output on the production line, there are hidden costs associated with their use. In addition to internal problems, companies are being forced by pressures from both foreign and domestic competitors to seek solutions to sagging productivity [T06:7].

Just as with any other critical resource, employee motivation should be a key area of management concern. Management should recognize, however, that reapplication of traditional techniques will only intensify current labor problems [T06:7].

In an attempt to correct or alleviate the above stated problems, management has adopted many of the organizational interventions suggested by the behavioral sciences. This study examines one of the newest techniques in American society -- Quality Circles.

> This technique offers a significant potential for tapping the wealth of imagination and ingenuity that lies within each worker. Called "Quality Circles", it provides an environment for active participation of employees in areas of problem recognition and analysis, together with implementation of corrective measures /58:197.

The Quality Circle process is an organizational intervention that has attempted to combine the best aspects of other intervention concepts into one process which recognizes, involves, and develops the creative intelligence of the worker.

America taught the basic techniques and concepts to the Japanese thirty years ago. They adopted them, we ignored them; and now we are desperately trying to catch up with our own concepts /117.

The Japanese have proven that lack of resources causes absolutely no barrier to world economic power, as long as a widespread, positive work ethic exists within the nation. Conversely, American management has generally sought to mechanize and routinize tasks which rob people of their creativity. The notion that management has all the

answers to worker problems can be deduced as causing America's pitifully sagging productivity and alienation of the worker [29:35].

The American Military Perspective. This same scenario can be correlated to the American military. Budget cutbacks and austere funding emphasize the need for optimal use of resources in the military. Since personnel costs comprise about forty percent of the Air Force budget, any program that asserts people building as its basic philosophy must be extensively investigated for its potential benefits to Air Force personnel. Only people have the capability to adapt limited resources to accomplish a mission. Thus, their welfare is a critical concern. As one Air Force general wrote:

> People are our most valuable resources and we must consider their needs and ambitions in our planning. Failure to do so increases the probability that we will be unsuccessful in attaining our objectives [19:47].

The costs to the nation associated with the failure of the military to accomplish its mission are imponderable. However, not every military job situation (combat) lends itself to the Quality Circle process. But, the flexibility of the concept indicates that a well designed process of Quality Circles can serve to alleviate quality and productivity problems under appropriate circumstances [22].

Justification. Quality Circles are generating increasing interest from private sector corporations and from the

Department of Defense (DOD), and have of late received a great deal of attention from the popular media [82]. In spite of this increasing interest, the authors found no solid empirical research on the subject.

A number of Quality Circle processes have been implemented in the Air Force and other federal organizations. The most noteworthy process began in March 1980 at the Oklahoma Air Logistics Center, Tinker AFB, OK. This program began with thirty-eight Quality Circles and has expanded to over seventy at present. This expansion was based solely on the enthusiastic testimonies of the original thirty-eight Quality Circle leaders [78]. Although many Quality Circles have been implemented in both the public and private sectors, there is little empirical evidence supporting the Quality Circle concept.

Problem Statement. The Quality Circle concept has been applied with varying degrees of success to many different organizational settings and tasks. The researchers know of no solid empirical research that provides significant statistical justification of the Quality Circle concept. In the past, the success or failure of Quality Circle processes have been measured by various costs, quality, and attitude measurements. For example, cost/benefit analysis, defect reduction, better safety records, less absenteeism and turnover, better morale, and others; none of which can be

attributed solely to the introduction of a Quality Circle process in the absence of experimental research. Because of time constraints, the problem for research is to determine the most significant basic elements inherent in a successful Quality Circle process.

Objectives. Since this is the first such study accomplished within the Air Force, we will determine the most significant basic elements inherent in a successful Quality Circle process.

Research Questions

1. What are the most significant basic elements necessary for a successful Quality Circle process?

2. What is the rank order of significance of these basic elements?

3. Can a general model be suggested for implementing a Quality Circle process?

CHAPTER 2

THE QUALITY CIRCLE CONCEPT

This chapter will present a general perspective of Quality Circles, including a brief historical background, the Quality Circle process, and the impact of Quality Circles upon an organization.

Quality Circles Defined. "A Quality Circle is a small group of people from a common work area who meet voluntarily on a regular basis to identify work-related problems, analyze the problems, develop solutions to the problems, and implement the solutions /217." The basic structure of a Quality Circle includes five to ten workers who voluntarily meet for about an hour usually once a week. Even this basic structure is flexible with the workers deciding their own specific structure. This freedom is intended to compliment the people-oriented philosophy that is the core of the Quality Circle concept.

The basic philosophy of Quality Circles is that overall quality of work life can be improved. Dr. Deming states that Quality Circles should be recognized as a change in management style to bring about a productive atmosphere/86:77.

In simplest terms, Quality Circles cause, "... a situation where management backs off and gives the workforce the appropriate training and the time to help solve problems. As the workers resolve problems, management gains a new respect for their capabilities, and as their suggestions are acted on the workers can see their influence on the work process ..." which gives a real basis for new attitudes [86:67]

Participation in decisions that affect a worker's life is one of the keys to making the goals of an organization congruent with the goals of the worker. Both the organization and the worker can benefit from participative management because top managers do not possess the expertise that the worker has, and vice versa, but together they can make the best decisions for all concerned. Management can provide this type of environment through Quality Circles [7:1847].

In general, supervisors and managers of an organization are introduced to Quality Circles in a seminar. The supervisors are then trained in techniques of organizing, training, and maintaining the Circles. Supervisors are selected as leaders and present the process to their people who are asked to volunteer for membership. Each Circle is formed of eight to ten people who meet an hour weekly with their leader in or near their work environment. The Circle members identify problems and make recommendations for their solution [4].

Historical Background. Before World War II, "Made in Japan" was synonymous with cheapness and poor quality. In order to reverse this trend, the Union of Japanese Scientists and Engineers (JUSE) organized a quality control research group in 1949. The first Statistical Quality Control (SQC) seminar was held by JUSE in 1949 to study statistical techniques for quality control. In 1950, Dr. W. E. Deming and, in 1954, Dr. J. M. Juran, were invited to Japan from the United States to lecture and teach their concepts for statistical quality control and the management of the quality control function. These initial efforts were directed towards managers and engineers. The Japanese Standards Association (JSA) published two periodicals, Statistical Quality Control (SQC) and Standardization and Quality Control (S&QC), with emphasis on Total Quality Control (TQC) from the teachings of Dr Juran. Also Dr Deming's concepts left such a deep impression upon Japanese managers and engineers that, even today, the annual "Deming Award" is the pinnacle achievement for an individual to receive for contributions to quality and productivity /54:Apdx-47.

The initiative for the Quality Circle concept came from Dr Kaoru Ishikawa, a professor of engineering at Tokyo University, and the editor of Gemba to QC, meaning, Quality Control for the Foreman. While Ishikawa, "The Father of Quality Circles", was developing his concept, the Japanese

government sponsored JUSE to conduct, throughout the 1950s, a series of mass media quality control lessons presented to all levels of management. As the background of trained foremen and managers grew, the logic of extending quality control training to the rank and file became evident. The mechanism used to accomplish this proved to be Ishikawa's Quality Circle concept. In 1962, the first three Quality Circles were registered with JUSE, and today one in every eight workers in Japan belong to Quality Circles totalling over one million registered and many yet unregistered Circles, and many thousands exist in other countries [17].

As of 1973, it was recognized that the success of the Quality Circle concept in Japan had been due to the expert guidance received from JUSE [17]. JUSE served as the central source of information and materials for those who wanted to establish a Quality Circle process in their company. Further, it was realized that successful introduction of Quality Circles in other countries would require a similar focal point of leadership. It was felt that JUSE would not be appropriate because of cultural differences and the language barrier. Because of this language barrier, there were several attempts to find an existing organization to provide this focal point within the U.S., but only two organizations, the American Management Association (AMA) and the American Society for Quality Control (ASQC), gave

serious consideration to their involvement. However, years passed with little progress because of the size and complexity of these two organizations [4, 7].

In 1977, J. F. Beardsley and D. L. Dewar founded the International Association of Quality Circles (IAQC) to provide the centralized leadership necessary to promote Quality Circle programs, particularly concentrating on the growth of the Quality Circle concept. From its inception, the word "Control" was dropped from the term "Quality Control Circles" because it was too limiting for many people in personnel and nonmanufacturing areas, and the negative connotations sometimes identified with the words "Quality Control". For them it meant some kind of "inspection" program [23:C5-97].

It was not until 1974 that a U.S. company began a Quality Circle process. In 1974 Wayne Rieker of Lockheed Missile Systems Division started a Quality Circle process which closely followed Japanese methods and even used Japanese training materials [93]. Based on early evaluations of their Quality Circles, Lockheed reported increased employee satisfaction and savings of three million dollars in a two year period [100].

The theoretical basis of the Quality Circle concept is seated in the rationale that Quality Circles are assumed to function best in organizations where participative management style is present and where mutual loyalty and respect exist between workers and management [56].

Impact of Quality Circles. Quality Circle advocates suggest that there are many reasons why some Circles are doing better than others. Generally, the reasons can be traced to inadequate management perspective, implementation problems, Circle leaders, members' participation and inadequate training [4]. If one factor of successful Quality Circle activities needs to be pointed out, it would be the leadership exercised by Quality Circle leaders. A successful Circle leader will steer and encourage discussions among Circle members [86]. Unless the leader knows where he is going, most likely his/her Circle members may not know where they are going either. That's where the need for a strong leader training program is necessary [86].

The University of Chicago conducted a study on twenty-nine companies with active Quality Circles to assess the impact of the Quality Circles process upon each company. The study showed that only eight of the companies had successful processes. However, the most important reason that the eight succeeded was the complete and effective training received by the Circle leaders [92].

> Management may view Quality Circles as a tool whereby paid employees are motivated. When the perspective of management is limited to this single goal it is woefully inadequate -- even antiquated. The real solid basis for bringing Circles into a company is that it represents a model whereby hourly employees may participate in the problem solving management style [2].

According to Dr Robert Amsden, management which sees Circles solely for the purposes of motivation, does not aim high enough. The lesson of the Hawthorne studies and subsequent remedies incorporated by Western Electric are indicative of this incomplete management view [2].

Claims about the success of Quality Circles fill the popular media, but very few well documented studies are available, except for annual reports published by JUSE. However, Quality Circles appear to have many positive effects. Circle solutions are credited with sizable cost savings; documented return on investment has been reported to be between 2:1 and 8:1. Reduction of product defects, increased product quality and greater safety awareness also result from Circle efforts. While hard measures of improved productivity are usually not reported, most companies using Quality Circles cite supervisor observations and meeting schedules as indicators of the positive effects of Quality Circles [78:37]. Northrop and others cite personnel benefits such as marked reductions in absenteeism, grievances, and terminations [85]. Attitudinal surveys from Lockheed, Westinghouse, Naval Ordinance Station Louisville and others show that a majority of participants feel that Quality Circles make their jobs more enjoyable, improve communication with management, and improve relationships with co-workers. Almost all workers feel that the programs should be expanded [100:10].

The Quality Circle Process. Most Quality Circle processes are comprised of a coordinator or Steering Committee, one or more facilitators, Circle leaders, and volunteer Circle members [91]. The roles of the various positions are described in detail by both consultants and programs coordinators in the IAQC International Conference Transactions. According to Rieker, the coordinator should be an executive-level line manager on the principle that this will insure management support and adequate funding. Whereas Dewar and Beardsley recommend the use of a steering committee composed of employees representing a broad range of interests, such as production, engineering, finance personnel, and the union [7_7].

The Quality Circle Consultant provides all the necessary training and instructional materials to the facilitator. The facilitator is responsible for the actual operation of the process, trains leaders and members in problem solving techniques, and trains leaders in group dynamics [92].

The Circle leader is generally a first line supervisor within the Circle work area; he or she assists the facilitator in member training and conducts Circle meetings. Voluntary Circle members meet weekly, initially to receive training and then to work on projects.

The recommended Quality Circle cycle is illustrated in Figure 1 below:

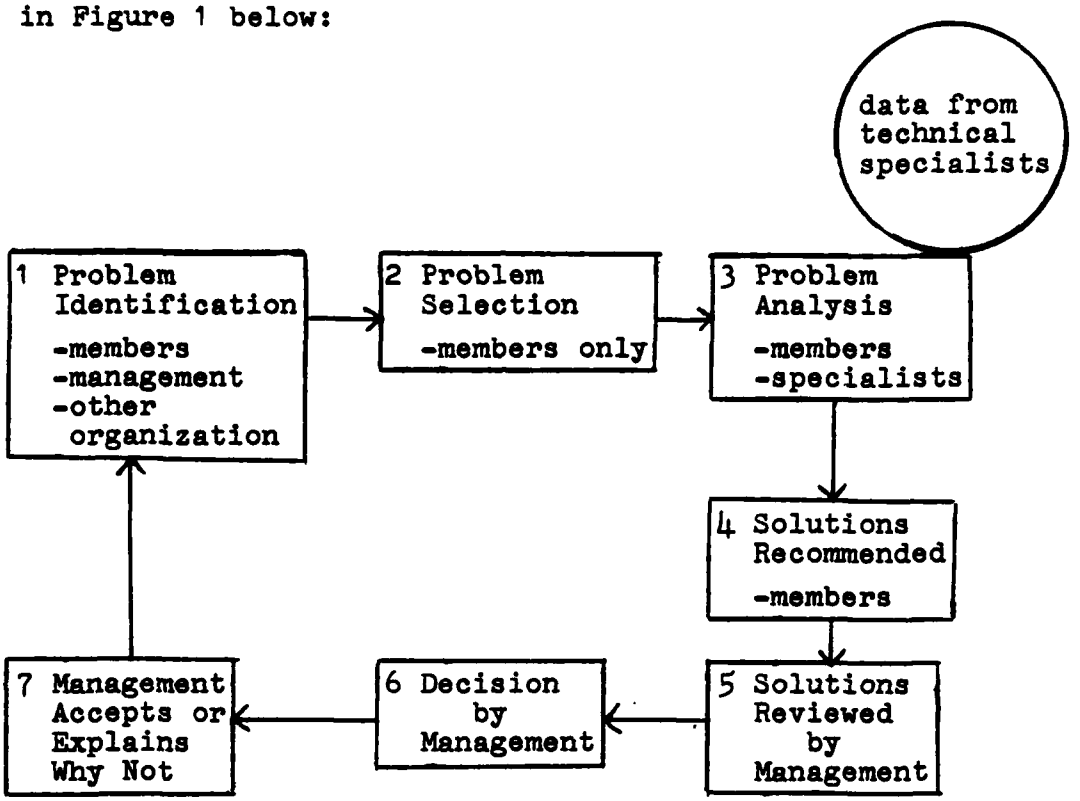


Figure 1
Quality Circle Process [897].

Subjective Research. Most of the American literature reports subjective testimonial as their basis for describing the impacts of Quality Circle applications.

At Lockheed, a Quality Circle group in the Plastic Shop developed a method to mold a plastic part assembly in two steps instead of five. The revised assembly was lighter and stronger, and amounted to a savings of $160,000 over the life of the contract. Since 1974, Lockheed's savings realized

from its Quality Circle efforts have amounted to almost three million dollars, six times the cost of operating the Circles [100]. Additionally, Lockheed developed measurement techniques which were utilized to assess the effect of the Quality Circle in their manufacturing operations. The Circles involved in this process were in development areas and did not lend themselves to objective measures [93]. Consequently, most of the measurement involved subjective information. Some of the findings from this effort included:

-80% of the members felt that the program had made a positive impact on the quality of the workmanship within their work team.

-70% felt that the quality of their own workmanship had improved.

-90% felt communications within the work team had improved as a result of the Quality Circle experience.

-80% felt that the cost of the program was justified by improvements in the products turned out by their organizations.

-25% gave up their own time-lunches, breaks, or after hours to the program.

-[100].

Westinghouse Defense and Electronics Systems Center, Baltimore, Maryland, has documented intangible accomplishments as the results of Quality Circles; measurement, of

course, is subjective. Listed below are typical examples of questions and answers taken from a comprehensive survey:

-Has the Quality Circles process made your job more enjoyable? Yes. 82%

-Has the Quality Circles process made an impact on the quality of workmanship within your work team? Yes. 92%

-Have you spent some of your own time (lunchtime, breaks, at home, etc.) on Quality Circle matters? Yes. 80%

-Should the Quality Circles process be continued and extended to other groups? Yes. 100%

-[80:99].

At the Norfolk Naval Shipyard, whose twelve thousand employees make it the second largest employer in Virginia, in June 1979 Quality Circles were introduced to its employees. For every dollar invested, Quality Circles saved the Norfolk Naval Shipyard $3.75. The net savings after operating the program, including staff time and travel, was $150,000 in the first year [66].

In addition, cost savings studies in both Japan and the United States have consistently shown the following advantages: improved communications at all levels up and down the line, a reduction in conflicts between employees, supervisors, and management, improved quality and greater awareness of cost [66].

In Toyota Motor Company's Quality Circles and suggestion programs, 527,718 suggestions were submitted last year

with eighty-six percent of them adopted. About $2.5 million was awarded to workers for suggestions. It is estimated that the return to the company exceeded that figure by five or six times [90].

The reader should reference appendix F, page 137 for other examples of cost saving benefits documented by major corporations.

Summary. Many avenues of research are needed in the area of Quality Circles. With respect to recommending particular program characteristics, the lack of hard research evidence makes it difficult to say what factors are truly essential to successful programs.

Still another area worthy of study has to do with the positive as well as negative effects of Quality Circles upon the organization and individuals operating within it. Studies conducted by many of the organizations that implemented Quality Circles indicated that the programs were successful; cost savings resulted; and both morale and employee satisfaction improved [33].

Finally, there is little American academic literature on the subject of Quality Circles. However, consultant literature is plentiful, but it is aimed at selling the product. The Quality Circle concept is a marriage of behavioral science concepts and statistical quality control techniques. The four basic concepts which Quality Circles

have drawn the best aspects from are: Participative Management, Team Building, Job Enrichment, and Goal Setting. The main goal of all these behavioral science concepts, improving the work ethic, will be discussed in the next chapter.

CHAPTER 3

BEHAVIORAL SCIENCE CONCEPTS OF QUALITY CIRCLES

This chapter will review four behavioral science concepts from which Quality Circles draw the best aspects of each concept. The four concepts are: Participative Management, Team Building, Job Enrichment, and Goal Setting. This chapter will include a discussion of the construct which these four theories attempt to improve, that is, the work ethic.

Participative Management. The purpose of this section is to review recent research in the area of Participative Management and draw some general conclusions about its effect on job satisfaction.

> Participative Management is a process by which workers are brought into their organizations decision-making process to varying degrees, but primarily on matters that directly affect them [68:517].

Three general topics of analysis appeared in the majority of the literature: what affect does participative decision making deprivation have on employee performance; what benefits can be gained from participative decision

making; and does the situation, complexity of the task, or managerial level of application of participative decision making have an effect on performance?

According to John M. Ivancevich, participative decision making (PDM) deprivation deals with employee perceptions in jobs in which he takes part in fewer decisions than he would like [50:255]. In the following two separate studies concerning decision making deprivation, factory workers were given questionaires in hopes of supporting several hypotheses.

Lawrence G. Hrebiniak's study examined "the relative impact of perceived deficiency in decision making and job level on individuals [48:649]." His research examined the effects of decision making deprivation in various levels of the organization. A cross section of tasks was also examined to see if task complexity had any bearing on the effects of perceived decision making deprivation. Hrebiniak's study also looked at what effects decision making deprivation had on "work related attitudes, interpersonal trust, role tension, and commitment to the organization [48:652]." The results of his study are somewhat mixed. There appears to be a strong positive relation between job level, trust, and commitment [50:600]. As employees ascended the organizational ladder they became more committed to company goals and more trust between fellow workers was exhibited. However, "job level and perceived deficiency in participation had differential effects on work related attitudes [50:661]."

In several cases a deficiency in PDM had no effect on a managers relations with others, but in some cases slight mistrust was exhibited [50:6617].

As for the line worker himself, "the data showed clearly that individuals who were decisionally deprived definitely wanted more influence, at the expense of the unit leader [50:6607]." Workers were upset because they had absolutely no say in decisions that directly affected their work. The "lack of participation seemed to accentuate malevolence and apparent inconsistency of the task unit environment [50:6607]." Throughout Hrebiniak's article, the word perception was stressed. As long as there is a perceived deficiency in the PDM process, dissatisfaction will occur to some extent.

Ivancevich's findings in a similar study showed that "decision making deprivation leads to job dissatisfaction and high levels of job tension [53:2547]." The reasons are much like those in Hrebiniak's study. When workers feel they have no say in decisions that directly affect them, they are less apt to perform at top efficiency. Ivancevich also had supervisors compare the performance of decisionally deprived workers against the performance of decisional equilibrium workers. The supervisors "rated the overall performance of the decisionally deprived participants ... significantly lower than decisional equilibrium participants

/48:265/." Although the effect of participative decision making deprivation may vary from task to task, level to level, and company to company, it still causes higher job related stress and lower job performance /50:256/.

The lack of PDM definitely has some detrimental effects. What are the benefits of a good PDM program? Several authors, through the use of questionaires, have investigated whether or not a good PDM program could reverse the negative trends of a poor one. The underlying theory behind much of the current research in the area of participative management can best be summarized by Kenneth J. White; "Present in the work force is a reservoir of creativity and experience that, if properly tapped, has the potential to greatly increase productivity /116:293/." Should this reservoir of creativity be tapped and the employees allowed to help make decisions concerning items that directly affect them, job satisfaction is believed to increase /43:335/.

Randall S. Shuler investigated this fact with regard to "participation and authoritarianism and task repetitiveness /102:321/." In his study, Shuler selected individuals who were employed at a manufacturing firm. He also chose several different tasks, ranging from high repetitiveness to low repetitiveness and from high authoritarianism to low authoritarianism.

Prior to administering a questionaire to all employees, Shuler developed two hypotheses he hoped to substantiate:

> H1: High participation will be satisfying for low authoritarian subordinates regardless of the degree of task repetitiveness, but will be satisfying for high authoritarian tasks with little repetitiveness.
>
> H2: Highly repetitive tasks will be less conducive to ego or job involvement of subordinates than tasks with low repetitiveness.

-[102:321].

The results of his research clearly support both hypotheses. In comparing one group of workers that were not allowed to take part in any decisions with one group that participated in a few decisions, and one group that had a great deal of decision making participation, he drew two conclusions. First, "participation had a significant main effect on job satisfaction," and "high participation was more satisfying than low participation [102:333]." His study also showed that the lower the repetitiveness of the task the more satisfied the workers were when involved in PDM [102:333].

George H. Hines also performed experiments to see if participation in managerial decisions by employees increased job satisfaction. His study, conducted in a large company in New Zealand, focused more directly on the employees perceived status level within the organization and how PDM affects his performance and job satisfaction.

Hines, "results strongly supported the contention that there is a positive relationship between high participation and high job satisfaction [43:338]." He also demonstrated that as an individual's perception of his status position in the organization increases, the higher his job satisfaction is [43:337]. This is most likely due to the fact that the employee sees the company as a friend and thus commitment to the organization increases.

Throughout this review, it has been argued that PDM is a benefit to both the individual and the organization in which he works. There are however, differences in the effectiveness of its application depending on the situation. "Not all research on PDM points to the unequivocal superiority of increased decision making involvement [50:254]." Various factors such as education, social background, personal values, and task complexity have a bearing on the effectiveness of PDM [55]."

Participation in too many decisions can decrease a workers perfcrmance [50:266]. As stated earlier workers are usually only interested in decisions that directly apply to their tasks. If they are required to participate in all company decisions they tend to lose interest and thus PDM has a negative effect. As a result,

> Participative management ... should be applied selectively for those individuals who according to their needs, values, and expectations would be expected to respond positively to such approaches [98:310].

The benefits gained from a good PDM program include, in addition to job satisfaction and better task performance; better information-flow, increased worker commitment and acceptance of goals, decisions, and problem solutions [99:777].

The general feeling of all the authors is that participative decision making is a benefit to both the organization and the individual. However, the application of the process in various situations and job types will yield varying results. "The relationship between participation is moderated by factors such as task complexity and subordinate's independence needs and intellectual capacities [55:7227]."

Finally, management's position on PDM program can be negative. Supervisors were willing to go along with participative decision making as long as traditional managerial prerogatives were not affected. A PDM program must be accepted from the highest level of management to the line worker in order for it to be successful [99:857].

Team Building. According to William G. Dyer [287], the most significant breakthroughs in organization theory and practice came in the late 1920s and early 1930s with the now-classic Hawthorne Studies [287].

This research, conducted by a group of Harvard professors at the Hawthorne, Illinois plant of the Western Electric Company, started out with the purpose of finding out the relation of the quality and quantity of illumination to the efficiency of industrial workers [287].

The first phase of research resulted in some puzzling data. In one experiment the workers were divided into two groups. One group, called the "test group" was to work under different illumination intensities. The other group, called the "control group" was to work under an intensity of illumination as nearly constant as possible. During the first experiment, the test group was submitted to three different intensities of illumination of increasing magnitude. Production increased in both rooms /967.

In another experiment, the light under which the test group worked was decreased, while the control group worked, as before, under a constant level of illumination intensity. In this case the output rate in the test group went up instead of down. It also went up in the control group /967.

In still another experiment, the workers were allowed to believe that the illumination was being increased but in fact, no change occured. The workers reacted favorably to the alleged improvement in lighting conditions, but there was no appreciable change in output. Not until the illumination decreased to that of approximately equivalent to ordinary moonlight did production output decline /967.

The researchers were not quite sure that they understood what was happening. This led to a series of research activities designed to examine what happens to a group of workers under various conditions. Data was collected over a

five year period under different conditions -- rest periods, refreshments, and shorter work week, etc. It was discovered that the most significant factor was the building of a sense of group identity, a feeling of social support and cohesion that came with increased worker interaction [28].

Douglas McGregor emphasized the group-team concept as an important part of organization and management theory [74]. One research study of the top management groups found that eighty-five percent of the communications within the group took place between individual subordinates and superiors, and only fifteen percent laterally between the subordinates [74].

The basic purpose of team building is to provide a means by which the members of a group can examine their own behaviors and develop courses of action which will improve task accomplishment [5]. Beckhard [11] identifies three models that are commonly used in attempting to deal with a client's problems. The purpose of the "role model" is to examine and clarify the roles of each team member. This model explores such issues as leadership, power or intergroup relations. If the "interpersonal model" is applied, the major thrust would be to improve the climate of the group. This leads to higher levels of trust and openness with the group. Finally, under the "goal-setting model," the team

building efforts are focused on establishing goals and action plans which help to ensure the goals are reached [17].

A study by Hackman, Weiss, and Brousseau [35] indicated that benefits can be achieved in group performance effectiveness studies by means of an approach involving the experimental creation of non-traditional patterns of behavior in groups. Groups that were artificially forced into interdependent action and coordination displayed higher levels of production and more satisfaction with the task and with each other, than did the groups that were left to their own devices. This point suggests that groups can be induced to attain higher levels of job satisfaction and performance if the proper techniques are developed and implemented [35].

According to Hare [40], the group (team) problem-solving sequence involves the three stages of definition, discussion, and working-through. Since these stages require interdependence among group members, each member "must reexamine his view of the problem in the light of the views of the group [40]."

The influence of the group (teams) on the individual can profoundly affect thoughts, feelings, and acts [57]. Studies by Marguart in 1965 and Lorge, Fox, Davitz, and Brenner in 1958 showed that the group is usually better at task performance than the average individual [40].

According to Argyris, a good team has task specialization and division of labor. Also they state that "each person shoulders a different part of the total job, with each having one hundred percent responsibility for success of the whole ... [3_7]."

According to Argyris, the overall goal of any team-development program is to improve the effectiveness of a group that must work together to achieve results [3_7]. Ordinarily a team building program will follow a cycle similar to the cycle below:

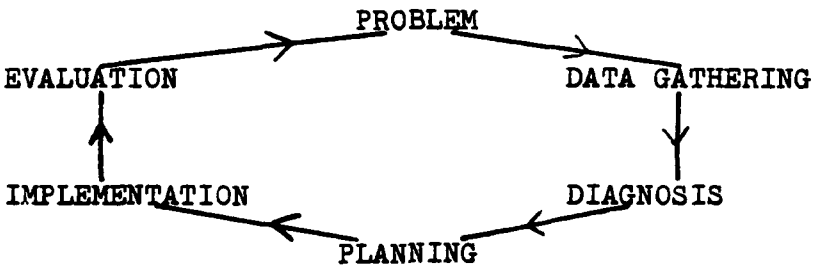


Figure 2
Team Building Cycle [26]

According to Dyer [26], one of the biggest problems that interferes with a working unit functioning effectively as a team is the "boss", or manager. Dyer further states that unless, the manager's negative attitude toward the team changes, team-building efforts are useless [26].

According to Dorey and Pattern the results of successful team building activities is the improvement of team member understanding of the way authority, control, and power

affect problem solving and data gathering [28]. Further, team building enables the members to gain a better understanding of themselves and become better able to diagnose and solve their own problems.

A study by Dorsey and Pattern [27] with high-ranking civilian managers (modal rank was GS-15) and military managers (modal rank was Lieutenant Colonel) in the U.S. Army Communications Command (ACC) located in Arizona, resulted in overall improved management skills. The study was the result of seven, one-week team building seminars/workshops enrolling about thirty-two persons each. The participants were assigned to five and six-person teams during each of the seminars, which yielded about forty different teams. After this, testimonial-type questionnaires were given to each participant. The results indicated that team building helped the members to better understand people, become better communicators, improve managerial skills and obtain a greater awareness of interpersonal skills in working with others [27].

According to Lewis [70], team building is not for everyone. Lewis identifies certain basic assumptions which, if not met, would suggest that team building would not be appropriate [70]. He says:

> Team development and a decision to pursue it in an organization rests on a number of critical implicit assumptions. It is worthwhile to identify them, since if one or more of these assumptions do not apply to a particular management

> group or its situation, undertaking a team development effort may be unnecessary, detrimental or both [70].

The basic assumptions are:

-Current patterns of communication and interaction among members of a group are inadequate for group and organizational needs.

-The concept of being (or desiring to be) an integrated team exists in the minds of the executive and managers in the group.

-Significant face-to-face interaction among members of the group is expected by the executive and/or is required by the needs of the organization.

-The executive can and will behave differently as a result of the development effort, and team members can and will respond to his new behavior.

-The organizational tasks assigned to the group require close and frequent coordination laterally among group members in such matters as planning, problem solving, and decision making.

-The benefits in terms of group effectiveness and member satisfaction to be gained from team development outweigh the costs incurred from altering existing role and social network arrangements to which the group has accommodated.

-[70].

Thad B. Green [34] conducted a study to empirically examine the belief that nominal grouping is superior to

interacting groups for the problem identification phase of the decision making process, regardless of the style of leadership employed in the interacting groups. Green [34] hypothesized that:

> H_0: Performance of nominal groups in tasks of problem identification exceed that of interacting groups using permissive, democratic, and authoritarian sytles of leadership.
>
> H_1: Performance of nominal groups in tasks of problem identification does not exceed that of interacting groups using permissive, democratic and authoritarian styles of leadership.
>
> -[34].

The subjects of the experiment were seventy voluntary university juniors and seniors enrolled in a course in electronic data processing. The experimental design consisted of six, five-man nominal groups and eight, five-man interacting groups for control. Three groups employed the democratic leadership style, three groups utilized the permissive style of leadership, and two had authoritarian leaders [34].

In this study there were no statistically significant differences between the quantity and the quality of nominal grouping performance and the performance of the interacting groups employing permissive, democratic, and authoritarian leadership styles. Performance was evaluated in terms of the total number of items generated, the number of unique responses, and quality of the responses as measured by the three criteria [34]. However, an analysis of covariance indicated that:

> Performance of the interacting groups with permissive leaders was significantly greater in terms of number of unique responses than was performance of the nominal groups when adjustment was made for differences in the total number of responses. After a similar adjustment, the performance of interacting groups with authoritarian leaders was superior to that of the nominal groups when the severity performance criteria were used [34].

Thus, when members of a group (team) interact and possess an attitude of willingness to communicate by sharing their knowledge the results of the team performance will be superior over individual performance.

According to theorists, Team Building provides a promise for increased organizational effectiveness. This is primarily so because the team regularly receives feedback. According to Bowers and Franklin [13] the use of feedback for group interventions in organizations is based on the view that receiving feedback is a potentially significant event in the life of a group performing work. In a field experiment, Bowen and Siegel [12] examined groups of students in a graduate class and found that feedback was related to increases in motivation and group effectiveness [12].

Likert in "New Patterns of Management" developed the notion that organizations were a series of interlocking groups and the manager as a "linking pin." Likert further felt that managers must learn to cope with a totality of people under their direction and not just manage individuals one-on-one [11]. Likert further identified twenty-four properties and performance characteristics of the ideal, highly effective group, among which are:

-The members of the group are attracted to it and are loyal to its members, including the leader.

-The members and leaders have a high degree of confidence and trust in each other.

-The values and goals of the group are a satisfactory integration and expression of the relevant values and needs of its members. They have helped shape these values and goals and are satisfied with them.

-[71].

Finally, Team Building, like other organizational development interventions and management techniques, provides a promise for increased organizational effectiveness and health, but not a panacea [5].

Job Enrichment (JE)

This technique gained popularity in the 1970s. The intent of job enrichment focused on countering the worker's negative feelings brought on by strict applications of scientific management. Advocates of JE suggest that workers should no longer be considered subservient to machines. Rather, human reactions to the job should be the primary consideration when designing jobs.

Job enrichment is defined as:

The deliberate, purposeful inclusion of, or increasing the amount of, such dimensions as variety, task identity, task significance, autonomy, and feedback so that the individual will experience a sense of meaningfulness and responsiblity on the job [110:14].

Job enrichment assumes the best way to increase both performance and satisfaction is to concentrate on redesigning

the work itself [95]. Principally, the technique focuses on satisfying an individual's personal needs and goals through the work itself, rather than by work-related benefits such as pay, security, pensions, or other related fringe benefits [75].

Initially, successes in job enrichment application confirmed the publicized potential. Numerous case studies involving such companies as AT&T, Traveler's Insurance Company, Chemical Bank, and Kaiser Aluminum Company, have applied job enrichment techniques with very rewarding results in improving levels of performance and worker satisfaction [30]. However, as these job enrichment efforts have spread, increasing numbers of failures raised questions about the continued viability of job enrichment as a management technique [39]. As evidenced by Reif et.al. [95] in a study on three-hundred of Fortune's top one-thousand industrial companies, only thirty-seven of these companies had planned any job enrichment efforts. Additionally those companies planning these efforts were skeptical in their approach. Representative written comments from these companies, concerning their skepticism, were:

1. I would like to see more research prior to actually adopting job enrichment.

2. It (job enrichment) has limited applicability.

3. Problems in routine jobs are solved more efficiently by automation and technical improvements.

4. It is used reluctantly, but increasingly, and it is accepted with limited success [95:74].

One reason given for the quandry over job enrichment application was that existing theories were not adequate to meet problems encountered in their application [37]. One school of thought suggested that early theories did not account for the moderating effect of individual differences [38]. Specifically, the more complex, fulfilling jobs offered by job enrichment would be motivating only to individuals who have a strong desire for the high order growth needs (self-esteem, personal accomplishment, prestige) associated with those jobs [38:284]. Conversely, those individuals who have little desire for higher order growth needs are posited to have a high desire for social interaction needs (friendship, dealing with others) and would be motivated by jobs with greater opportunities to fulfill those social needs [103:226]. In general, proponents of job enrichment agree that the job enrichment process is somehow linked to the psychological make-up of the individual, and there is strong evidence supporting the individual difference approach to explaining this link. However, this support has been inconclusive. Therefore, for job enrichment to remain a viable technique, the underlying theory must focus on how the characteristics of jobs and the individual differences of workers interact to determine when an "enriched" job will have beneficial outcomes, and when it will not [37:251].

In practice, job enrichment techniques seek to increase satisfaction by giving the employee a greater chance for personal achievement, recognition, and advancement while providing him with more challenging and responsible work [41]. Research indicated that many prominent behavioral scientists maintained initially that such techniques would lead to higher levels of motivation, satisfaction, and productivity among workers involved [38]. However, after early successes in JE implementation, it became apparent that there were serious problems inherent in the method of employment [36:57].

While JE efforts give opportunities for higher levels of performance and achievement, they also give little reason to achieve any less than had been achieved. Also, not all employees welcome JE efforts, but as long as "the changes are opportunities rather than demands, there is no reason to fear adverse reaction [88]."

Additionally, Herzberg indicated that job enrichment is not a one-time action, but a continuous one whose initial changes will last for a long time. Job enrichment has been shown to have a positive influence on employee satisfaction, even though JE programs are not always welcomed by workers. Job enrichment has been credited with reduction in absenteeism and turnover, and with increasing satisfaction, productivity, and quality of output. Through the use of JE efforts, managers and researchers have sought the answer to increased productivity as a result of increased worker satisfaction [41].

Initially, much of the interest in JE was based on the belief that job satisfaction led to higher productivity. This view has now been discredited and most psychologists do not feel that satisfaction increases productivity [6,7]. There is little in the literature that suggests a causal relationship between satisfaction and productivity. If anything, both drive theory and expectancy theory would seem to predict that high satisfaction might reduce motivation because of a consequent reduction in the importance of various rewards that may have provided motivational force [6,7].

A review of the literature revealed several examples of increased quality levels that were attributed to JE. Increased worker satisfaction is a byproduct of higher quality levels, and most workers take pride in producing quality products while working with a company which encourages high quality standards [5,7].

In general JE programs can have a positive effect on worker satisfaction. Little support is found for the contention that productivity is increased by JE. In contrast, quality levels appear to be enhanced by job enrichment.

In 1974, Herzberg initiated his program of Orthodox Job Enrichment (OJE) at the Ogden Air Logistics Center, Hill AFB, Utah.

> The objective was to inaugurate projects that would impact on areas of fragmented jobs and heavy workload requirements typified by low job sastisfaction and low productivity. Different functional

> areas also were included in order to observe the applicability of OJE in a diverse range of activities [42:39].

Herzberg enriched jobs at Ogden using such motivators as direct feedback, personal accountability, recognition, customer relationship, and responsiblity. This program resulted in substantial monetary savings and increased job satisfaction. In interviews with participants in the program, Herzberg learned that supervisors felt that the enrichment program gave them a greater understanding of their subordinates' needs [41:54]. Although many organizations have used Herzberg's theory with success, researchers have had difficulty trying to apply empirical measurements to the motivators.

The Hackman-Oldham approach toward job enrichment built on and complimented the previous work by Herzberg and provided the tools for diagnosing existing jobs. The Hackman-Oldham model asserted that three psychological states are critical in determining a person's motivation and satisfaction on the job [36:57]. The three states of experienced meaningfulness, experienced responsiblity, and knowledge of results compose a person's internal motivation.

> ...being turned on by one's work because of the positive internal feeling that we generate by doing well, rather than being dependent on external factors (such as incentives or compliments from the boss) for the motivation to work effectively [36:2].

Considerable empirical support for the Hackman-Oldham model has been provided by applying their Job Diagnostic Survey.

The Hackman-Oldham model provided a new understanding of job enrichment and how it can increase job satisfaction.

Job enrichment techniques have been applied with varying degrees of success to many different organizational settings and tasks. Unfortunately, with the spread of JE efforts, an increasing number of failures raised serious questions about the continued viability of JE as a tool for organizational change. Wholesale application of JE has not proved to be the best approach. Not all individuals are motivated by work itself, nor can all tasks be enriched [36:70].

Goal Setting

Edwin Locke's goal setting theory has the basic premise that an individual's conscious intentions regulate his actions or task performance. Locke's theory is divided into three main assertions. First, specific goals result in greater output than greater goals. Second, difficult goals result in greater output than easy goals. Third, goals serve to motivate performance, only if they are accepted [72:157].

Recent research generally seems to indicate that the advantages of either assigned or participatively set goals over the other were inconclusive. Latham and Yukl [62] found that uneducated loggers had higher performance when goals were set participatively rather than assigned. However, neither form of goal setting affected the performance of educated loggers. In another study by Latham and Yukl [63], the

research revealed no significant difference in the performance of female typists, whether they were assigned goals or participated in the goal-setting process. The results did indicate that other unspecified factors in addition to participation are important and should be researched. They also indicated that, overall, the amount of subordinate participation in goal setting was not as important as the actual setting of the goal itself. Employee participation in goal setting may be important because it helps in goal acceptance and commitment.

The previously cited research focused on workers with fairly low skill requirements. A study by Ivancevich [51] used a field experiment with 179 skilled technicians and 28 supervisors in three different plants of an equipment and parts manufacturer. The study lasted thirty-six months. Personnel in plant one were trained in participative goal setting, plant two in assigned goal-setting, and those in plant three were told to "do their best." Each plant had approximately the same number of workers involved in the program. Four dependent performance criteria were used to assess the effectiveness of the technicians (unexcused absenteeism, service complaints, cost of performance, and safety). The results indicated that formal goal-setting, both participative and assigned, resulted in reduced service complaints, lower costs of performance, and better safety records, as well as higher satisfaction with work and supervision. For unexcused absenteeism, there was no significant difference between the groups.

The study provided further support that specific goals, if accepted, lead to a greater increase in performance than generalized goals. Overall, the assigned goal setting group showed slightly more improvement than the participation group. However, these improvements only lasted for six to nine months. In addition, job satisfaction declined slightly in both goal setting conditions. This seems to indicate that a reinforcement program with extrinsic or intrinsic feedback or refresher training is needed in order to sustain task performance and satisfaction improvements.

Additionally, Ivancevich and McMahon [52], and Steers [105] studied technicians who were assigned goals, and concluded that goal acceptance is more important in job performance for individuals with low need for achievement. Mossholder [76] also researched the effects of assigned versus no goal situations, and found the goals had a positive effect on performance, whether the task was boring or interesting. However, under interesting tasks, assigning specific, difficult goals decreased task interest, persistence, and satisfaction with the task. With boring tasks, only task interest decreased.

The previous studies have concentrated on the topic of assigned versus participative goals. Bassett [6] looked at the effects of choice on achievement of goals. Under experimental conditions, 116 subjects in two major Connecticut cities were hired for a days temporary employment, checking task clerical accuracy on documents. Workers were given

a preliminary Hackman and Oldham [37] Job Diagnostic Inventory and divided randomly into groups to be tested under "Choice" and "Preference" conditions. They were varied according to task goal level (high and low), work schedule (normal and compressed) and degree of choice of goal and schedule (free choice among alternatives, assignment to preferred pace, and assignment to non-preferred pace). Dependent variables were rate of work output (quantity) and error rate (quality).

Error rate was unaffected by the individual's choice, or any other experimental treatments. Difficult work goals, a compressed work schedule, and a fast work pace all increased the rate of work output. Surprisingly, however, all workers who were arbitrarily reassigned improved their performance, and those who were given their choice of work goal produced at the lowest rate. The reasons for this were not clear and require further study. However, it was suggested that this could be a result of the reassigned workers striving to reach a more difficult goal.

A related area includes the study of incentives with respect to their effect in increasing commitment to goal setting. Terborg and Miller [108] used an experiment with sixty males recruited from a campus for a two-hour task constructing complex Tinker Toy models. Subjects were paid either on a piece-rate or hourly basis, and were assigned to either a quantity, quality, or no-assigned goal condition. Dependent

variables included quantity and quality of performance, as well as three measures of effort, and three measures of direction of behavior. The quantity and quality of the work produced was then measured.

The results demonstrated that performance can be predicted by studying the manipulation of different payment schedules and performance goals. Because of the many different effects these factors have, however, additional study is needed to better determine how they will be related. They did conclude that method of payment and goal-setting independently affect motivation and performance. This duplicates the position taken by London and Oldham [73]. A conclusion in each study was that goal-setting procedures should not replace financial incentives as a means of reinforcing performance in organizations. However, the research did not test the case where financial rewards were based solely on reaching the goal.

Latham, Mitchell and Dossett [62] provided only limited support for this theory. They point out that the amount of variance accounted for by monetary incentives is very small, and for all practical purposes, performance was relatively unaffected by money independently of the goal that was set.

Laboratory and field studies have given considerable support to Locke's theory. Latham and Baldes [65:122] as well as Latham and Kinne [68:287] found that specific goals lead

to higher productivity. The empirical evidence supports the theory that goal setting increases productivity.

Goal setting tends to make the worker focus on objectives and accomplishments rather than on activities. This may create a sense of wholeness in the job which may have been previously lacking. However, correlating back to job enrichment, an experiment was conducted which added goals to an already enriched job; no change in task identity was noted [11].

Goals may enhance an employee's perception of meaningfulness in his job by making the employee aware of his contributions to the organization.

> By seeing the "big picture" employees may better understand the significance of their job and may thus have an enhanced sence of worthwile contribution to the organization [12:8].

A goal setting program permits an employee to be responsible for the outcome of his work i.e. autonomy. However, when existing jobs were changed to add goals, but without worker participation in setting those goals, no significant change in autonomy occurred. This led to the assertion that only participative goal setting results in a higher sense of autonomy.

Another dimension inherent in goal setting is feedback. "Feedback is most powerful when it comes directly from the work itself [35]." Feedback provides vital information to energize the goal setting process and it reinforces progress

toward meeting a goal. Without this reinforcement from feedback, it seems unlikely that people would pursue goals as a desirable outcome [11, 27].

Commitment to goals set participatively is an added positive aspect of goal setting. Factors that cause commitment are not specific, but include a broad perspective of motivational concepts. Other behavioral theories enter into this area of goal setting theory. This leads to the association of goal congruence with group, organization, or professional identification. That is to say, whatever the motivation of the individual, as long as there exists goal congruence between this individual (or group) and the rest of the organization (or group), then commitment to the set goals will exist [9:80, 7]. However, all the research that has been conducted on goal setting is unable to provide results without qualification. The results of all this research must be qualified with statements that severely limit the applicability beyond the particular situation tested. This lack of universality results from the many different factors that are beyond the scope of goal setting theory. So, the effects of goal setting cannot be independently tested because other behavioral factors must be considered [11, 27].

A recent example of goal setting theory put to practice is Management by Objective (MBO). Various empirical research efforts have been conducted with MBO. One extensive study was performed with thirty-two branches of a bank and a

railroad company. The results for the bank and railroad indicated no significant difference and slight significance, respectively, between the experimental groups and the control groups. Unfortunately, there were admitted flaws in the research [11:76]. Additionally, firms should be cautioned against the "casual adoption of goal setting programs, such as MBO," and that management must ensure than an MBO program is tailor-made for their particular organization [77:13].

It was further proven that much of the research had serious shortcomings resulting from the almost exclusive use of Caucasian subjects. The study showed that the race of the participants does affect the results of the experiment. This further indicates that other individual background factors must be considered and compensated for in order to claim a valid experiment [53:287].

In summary, goal setting has shown that the technique will increase performance, but there is still an issue in whether or not participative goal setting is better than assigned goal setting. Additionally, the combinations of conflicting research, inconclusive research, and the exclusion of pertinent behavioral variables from research indicates a dire need for further research. However, considering the high dependence of goal setting on the many complex relationships that compose the work environment, conclusive research on goal setting theory, independent from other behavioral factors, may not be possible, and has yet to be performed.

Quality of Work Life (QWL)
-- An Objective

The specific name, Quality of Work Life, has been copyrighted by General Motors, and it is a generic term for the objectives of behavioral science concepts. QWL is seen as a goal and there are many interrelationships with Quality Circles that tie into employee perceptions. The QWL concept includes the evolutionary adaptions that a firm must accomplish in order to assure long-term survival. Along this same line, QWL techniques try to stimulate productivity through change and growth. QWL includes contemplation of the human condition and expectations, and the techniques try to change something inside and between goals. QWL concepts conversely realize that any change involves stress and hard work. Also, QWL techniques increase the worker's ability to influence change and this impact evolves over time. All these characteristics make it difficult for anyone to be against QWL, and thus the concept is an effective force for humanizing an organization. The culmination of applying QWL techniques is the movement toward and arriving at a sense of family within the organization [33].

Conversely, there are many differences between QWL and Quality Circles. QWL techniques work on macro-organizational problems whereas Quality Circles deal with problems within their own areas. Dealing with these macro-problems requires total involvement of unions with QWL; Quality Circles

do not deal with union problems. In light of this, QWL techniques can deal with almost any subject, including an organizational assessment. Because of this macro level approach, QWL includes both salaried and hourly workers, while Quality Circles, in their original initial stages, were geared toward hourly workers. However, there are no reasons why Quality Circles could not be applied to salaried personnel [33].

QWL and Quality Circles are both processes and concepts which will breed trust through communication, participation in decision making and employee development through recognition and involvement [33].

The need for QWL has arisen from our society's remarkable change in the last two decades. This change indicates the need for new requirements for relating to the workforce. Unfortunately, we are trying to move in two directions at once. On one hand, people are trying to express more individuality, while conversely we are more and more interdependent. The inherent internal tensions resulting from this duality are brought to the workplace, and it is progressive management's responsibility to try and understand this situation and provide solutions [85].

As Maslow, in his hierarchy of needs, would have put it, the older generation is operating at the safety and survival levels, while the young employees start much higher up the pyramid. This results from better education, being taught that they have a right to be heard, and having known only a high standard of living. All this indicates a higher level of needs and desires [85].

Intelligent management is realizing these traits of this new employee, and QWL sets the criteria for successful operations in the future. The workforce deserves respect, and responds positively to dignified treatment. This breeds a higher level of interest in their role in the organization, and a desire to participate by presenting their ideas for improvement if the proper solicitation is offered [85].

The Work Ethic

These four theories that we have discussed, as well as other productivity programs or concepts, have been designed on the common pretense of trying to improve the employee's work ethic. Dr David Cherrington, in his book The Work Ethic, describes eight principles for developing the values inherent in the work ethic. Before we discuss these principles, let us define how we and others see the work ethic.

The work ethic may be defined by a religious person as the belief that labor, in one's daily calling, is the only acceptable way to live before God. Another's definition may be; working to create wealth, to get money, a means to an end. In general, older employees who lived through the depression, immigrant craftsmen, and those who have always worked for a living have never had anything handed to them. The new employee, especially the ones who grew up in big cities, with large allowances and the family car, have a "you owe me" attitude. To reverse this trend, the philosophy must change.

Some employees begin a job with these values and principles but they lose them, they get turned off. From a business perspective, the work ethic would be defined as; the employee has a positive attitude, does the job well, and assists others in helping them to do their job well. This creates a winning individual, and a winning team [60].

From this business perspective, Dr Cherrington has taken all the behavioral sciences into consideration, put them together, and he says here is what must be present to make any of these productivity programs work. His eight principles are for developing work values toward building or rebuilding the work ethic [14].

The first principle is; the organization must have and encourage positive work values and a commitment to excellence. In other words, management must create favorable organizational climate. There has to be a commitment from the top to do a program [14]. Analagous to this, parents try to create a favorable climate for their children to grow and develop. Also, the Japanese have their practice of industrial paternalism which provides a favorable climate for their employees. This concept must even include examining how the organization fits into the rest of society; and thus the employees must agree with what the organization is doing in order to be committed to it. Similarly, if we are committed to the concept of the family unit, it will survive. If we are not committed to the family unit, it will not survive.

An organization must have this similar commitment if it is to survive. The Air Force tries to proclaim itself a family; retention statistics alone disprove that claim.

The second principle; communicate clearly the organizational expectations about productivity and high quality craftsmanship. There must exist productive communication between supervisors, peers, and most often left out, subordinates [14]. We are continuously evaluating our people. Many times these evaluations are only once a year. This informal evaluation process is totally inadequate. How often does an evaluator ask what can I do for you to help you do your job better. Even if this is asked, it must be done continuously, and not just on an annual basis. Part of this is developing explicit behavioral expectations. If we ask less of an employee or treat the salaried and hourly workers differently, we will get less and not have a team seeking the same goals, but vicious competitors. This can only breed ruin and extinction.

The third principle; teach and explain the value of work, the dignity of work. We must teach by induction, reasoning and explaining to an employee, on an adult level, why things are or must be done. And we must explain and get the employees to see pride of ownership in doing their part for the team effort with no bribery, no tricks, and no gimmicks [14].

The fourth principle; there must exist a voluntary personal commitment. This is only developed by involvement. Employees can't be told, we must ask for their input, their ideas on how to redesign their jobs to do them better. It is management's job to sell the organizational personnel on these new programs. If this sales task is done right, the employees will "buy" the concept and make it work because they believe in it. This is the most effective way to develop positive work attitudes and work ethics [14].

The fifth principle; provide feedback of performance. We make the mistake of evaluating only past performance. Beyond evaluating history, we must also evaluate what can be done in the future to improve the person and allow personal growth. A positive look at what we (supervisor/subordinate) can do in your individual case to evaluate your strengths and weaknesses, and work to improve your future and personal growth [14].

The sixth principle; reward performance with pay and other social reinforcements. One without the other is not nearly as effective as both together. And many times, only social rewards and recognition are necessary [14]. The U.S. Hockey Team did not win the gold medal in the 1980 Olympics for the money; there were much greater rewards. Just a little praise can go a long way.

The seventh principle; encourage employees in their personal growth and well being. Social and interpersonal

skills, as well as emotional and intellectual growth should be considered. The organization has to get involved with the employee; there has to be a commitment to the employee [14].

The eighth principle; establish individual accountability through effective delegation. The value of work and pride in craftsmanship tend to increase as people develop a greater sense of accountability and responsibility for their actions. Effective delegation involves three steps; an agreement must be established about the results to be achieved. Second, periodic reviews must be conducted to evaluate progress. Third, a final accountability report must be prepared. Developing individual accountability and personal responsibility are not acquired rapidly; they develop over a period of time. The process is effective only in an atmosphere that supplements personal choice, with effective performance evaluation and appropriate reinforcement [14].

All these principles are contained, to some extent, in all productivity programs. Unfortunately, most all of the programs have required some modification in order to be beneficial. Unfortunately, none of these programs inherently contained all eight basic principles [60].

A tool has been developed that takes all these principles and the best aspects of the four management theories, and combines them into one process commonly known as Quality Circles. But it must be emphasized that Quality Circles is

not some new panacea or cure-all for industry. The basic principles and concepts of the work ethic were inherent, to some extent, in all four theories. Those theories just did not go far enough; they did not do a complete job for management or the worker. Companies that have successful programs with any one of the four theories, have had to modify these programs from the original concept in order to make them successful [80].

Quality Circles - An Eclectic Approach

Quality Circles draw on the best aspects of the four separate theories of; participative management, team building, job enrichment, and goal setting. In addition, Quality Circles employ statistical quality control techniques that allow lowest level workers to define, analyze, and solve problems unique to their work areas.

The Air Force concerns over retention, training costs, and readiness have highlighted the importance of morale and satisfaction to the Air Force worker. While traditional work improvement efforts have concentrated on extrinsic factors such as pay, security, and working conditions; they have bypassed the intrinsic values of achievement, growth, and recognition that are key elements of job satisfaction, performance, and improvement of the quality of work life as viewed by the workers [31:63].

Quality Circles focus on improving the specific quality of work life, as determined by the workers, and approved by management. Thus, the workers tailor their Quality Circle process to their needs and desires. The process is a continuum and not a one-shot attempt at improvement. Recurring training and an iterative process causes Quality Circles to evolve and mature with the changing conditions of business and industry. Additionally, the Quality Circle concept has universal applicability, contrasted with Herzberg's own admission that Orthodox Job Enrichment cannot be applied to all tasks [22].

Putting the four theories together, a natural step is a teaming arrangement to solve problems, from which flow a natural, positive recognition for a job well done. A Quality Circle process must not be entered into lightly. Participation requires clear goals, and each process must be tailored to the specific company, with a required investment of resources over time. It must be realized that a deep change in the very conduct of business is necessary if Quality Circles are to be successful over a long period [8].

The process is not some mystical new panacea or cure-all potion for all that ails a business. In one way or another, all supervisors have used the basic concepts of Quality Circles by getting together with workers and discussing problems. The Quality Circle concept formalizes this process with proper training at all levels, from top management to line workers.

Unfortunately, every person's sense of history and experience causes a defeatist attitude toward what may appear to be just another management trick or scheme to get more work out of the automatons. "Here we go again ..." is a common grumbling, based on real experience, whenever a program comes along [26].

It must be stressed that Quality Circles are not a unique, new technique, but a combination of techniques that provide management with a new set of the best kind of consultants/experts, the workers who actually do the work. In effect, management is sharing the controlling function with workers and it is contended by some that all levels of an organization, even the lowest, are managers to some extent.

Quality Circles also address some inherent problems in middle management levels. The control function has been highly emphasized and taught to middle management, and sometimes that's all they are taught. Quality Circles allow us to gain more control, indirectly, over all our resources, i.e., the worker's intelligence, creativity, and dedication, among others. Additionally, there is a tendancy to presuppose a skilled level of management. It is essential that management be trained and educated also, and Quality Circles develop middle management skills. This training concept should be extended to include management Quality Circles, in fact, one company began its Quality Circles process by starting with management Circles rather than worker Circles. Through this

management improvement, a company can "grow" its own management team for the future. The point is, by the time a company realizes that it needs management training, it will be difficult to compensate for the damage already done [26].

In essence, Quality Circles take a total environment approach. While Quality Circles do not directly deal with three areas (personalities, union business, and money), many times the roots of these problems can be solved by Circles. In one instance, a union complained that the Quality Circles were solving the problems that the union had been complaining about. The unions are afraid that the workers won't need unions anymore. This leads us to conclude that unions and management do not understand exactly what is taking place. The company not only has the full dedication of the worker's hands, but they also have the full merit and contribution of their minds [79].

The idea and concept of Quality Circles sounds simple, and in actuality it is; the difficult task of Quality Circles is keeping it an ongoing process and a working way of life. Quality Circles has to be built into the very structure of the organization, only then is long-term success possible. Toyota has heeded this advice with its 45,000 employees. There are 4,300 Circles within Toyota, making eighty percent of the company active participants as Circle members [26].

Quality Circles are a marriage of behavioral science concepts and statistical quality control techniques. We have discussed the four major behavioral science concepts which Quality Circles draw upon as well as the major goal of all these organizational interventions -- improving the work ethic and ultimately productivity.

CHAPTER 4

METHODOLOGY

This chapter will describe the methodology used to determine the significant factors necessary for a successful Quality Circle process. An opinion survey was administered at the third annual conference of the International Association of Quality Circles (IAQC) on March 4-6, 1981 in Louisville, Kentucky. The survey was used to identify the most important significant factors inherent within a successful Quality Circle process. We will identify and rank-order the most significant factors, and use this analysis to design and formulate a general model for implementing a Quality Circle process in an organization.

The survey instrument was explained in very general terms to each participant with verbal and written instructions held to a minimum. Also, the survey contained only three questions, the third allowing for as much or as little input as the participant desired. The lack of instructions and openmindedness of the survey were intentional steps to insure that neither the researchers nor the survey instrument gave any leading information or influenced the answers of the participants. A copy of the survey instrument is attached as appendix A, page 121.

Population and Sample

The researchers individually selected the participants from the attendees at the IAQC conference on the basis of each person's known expertise in Quality Circles. The consensus experts from the United States were in attendance and as many of these known experts as possible were surveyed. According to Harvey Davis of the IAQC, a total of five hundred different companies were registered attendees at the 1981 IAQC conference, and Davis estimates that one thousand companies in the United States have active Quality Circle processes. Further, it is estimated that there are less than eighty Quality Circle experts in the United States [79]. Consequently a sample of approximately fifty of these experts is a significant statistical sample.

Advantages of the Sample

From the caliber of the individuals sampled and spontaneity of their responses, an accurate determination of the significant factors which are necessary for a successful Quality Circle process was expected. To clarify the composition of the sample, the individuals surveyed were directors, consultants, authors, and long time (since the introduction to the United States) practitioners in Quality Circles. The sample included members of the board of directors of the IAQC, program coordinators from major corporations, lecturers, and

university professors. Thus, within the realm of Quality Circle experts, business professionals and academicians on the subject were surveyed.

Survey Administration

Each participant was contacted on an individual basis and allowed to initially read the survey instrument. They were instructed to take as long as they wished to formulate their answers; response times varied from immediate to surveys being mailed back to the researchers after the conference. Most of the participants had questions concerning what their responses should be. The questions were not answered and all comments made by the researchers had no influence on the participant's response.

A total of fifty surveys were accomplished and the researchers consider this quite a significant number considering three factors. First, the IAQC was founded only four years ago. Second, there is relatively little subjective research in the United States concerning Quality Circles. Third, the researchers found no solid empirical research on Quality Circles. Consequently, the researchers have surveyed a significant majority of the United States experts in the field of Quality Circles.

Additional Validation

In addition to the survey instrument, two additional methods of data collection were used to enhance the survey

and to gain information for developing a general model for implementing a Quality Circle process. Personal interviews with the experts present at the IAQC conference to clarify and expand the survey questions; and attendance by the researchers at fourteen of the conference workshops added not only depth but also diversity to the data collected. The researchers found nowhere in the literature the diversity of opinion obtained at the IAQC conference. This concentration of expert opinion affords enhanced validity to the results of this study, due to the fact that we sampled approximately sixty-three percent of the known experts in the United States. It should be reemphasized that there was no collaboration of opinions by these experts prior to the administering of the survey and/or the personal interviews by the researchers.

Tabulation of Survey Results

The number of significant factors, identified by survey respondents as necessary for a successful Quality Circles process, will vary as a result of the openended nature of the third question. To limit the number of significant factors to be analyzed, closely related factors were combined whenever possible. Survey responses that could not be related to the resulting limited number of significant factors were eliminated.

In addition to tabulation of the rank order of significant factors, the total number of times that a factor was

identified had a bearing. In other words, if the factor label of "training" ranks third overall in the surveys, but it was mentioned with much greater frequency than the number two factor, this could indicate that training is the number two factor.

Additionally, each time a factor was mentioned, whether on the same survey or not, this added an amount (i.e., 1, 2, or 3) to the total summation of the ranks. Thus a correction factor had to be introduced to compensate for a particular factor mentioned more than once per survey. To accomplish this, a negative one (-1) value was assigned to a factor every time it was mentioned more than once per survey. For example, if the factor "management support" was mentioned three times on one survey, the second and third occurrances were each assessed a negative one (-1) value. In this way, a factor was not prejudiced by multiple responses within one survey instrument.

To apply this analysis technique, five rules should be followed:

Rule #1 - List each factor and the rank orders assigned from each survey, and assign a negative one (-1) value to each multiple response of the same factor within one survey instrument.

Rule #2 - Count the number of times a factor was mentioned within and over all the surveys (frequency of mention).

Rule #3 - Add up all the numbers from rule #1 including the negatives.

Rule #4 - Rank order the results on the basis of Rule #2, highest to lowest.

Rule #5 - Count how many times a negative one (-1) value was assessed, combine this list with rules #3 and #4 lists, and adjust to get the final rank order.

- Until the effects of the negative values are near zero, the highest rank orders will be determined by a combination of highest frequency of mention and lowest summation of terms. In this study, this changeover occurred after the number one ranked factor; see Table 1, page 70.

In summary, the final rank order of significant factors was tabulated by a combination of three methods. First, the position it was given within one survey instrument; second, the number of times the factor was mentioned per survey; and third, the total number of times a factor was mentioned over all the surveys.

CHAPTER 5

RESULTS AND FINDINGS

The results of the survey showed overwhelming agreement on the first two significant factors; 1. management acceptance/support/understanding, 2. training. The full results of the survey are as follows:

RANK ORDER	FACTOR NAME	FREQUENCY OF MENTION	RANK ORDER SUMMATION OF TERMS	# OF TIMES NEGATIVE (-1) VALUE ASSESSED
1	Management Support	63	25	22
2	Training	37	58	13
3	Voluntary	16	32	2
4	People-Building Philosophy	12	31	1
5	Sufficient time for Results	11	28	2
6	Communication	10	28	1
7	Team Effort	8	23	0
8	Participation	7	24	1
9	Recognition	6	24	1
10	Work Related	3	11	0

Table #1
Results of Survey

To explain Table #1, management support was mentioned a total of 63 times; because it was mentioned more than once on many of the surveys, the summation of all the rank orders

added up to only 25 because of the negative values assigned as explained in chapter 4, Methodology. Training was ranked second because it was mentioned 37 times and, since it was rarely mentioned more than once per survey, but near the top ranking, the summation of its terms added to 58 since there were very few negative values to lower its total; etc.

Next, a detailed analysis of each one of these significant factors is included with the experiences and opinions of the same experts who participated in the survey.

Management Acceptance/Support/ Understanding

The researchers have divided the role of management necessarily into three classifications; acceptance, support, and understanding. This division is necessary because the term "management support" is extremely ambiguous. It is quite presumptuous to believe that, by merely introducing this new organizational intervention to management, even with its record of success, that skepticism, lack of understanding, and fears of delegation will not be present.

Management Acceptance. The research has shown that management acceptance to try the program is all that is needed to get the process initiated. This means that Quality Circles must earn the support of management. As many of the experts have stated, there is no magic about Quality Circles, just hard work.

The assumptions of individuals sometimes block the support needed and it is essential that they rid themselves of these assumptions. For example, when an individual is asked where the problems in their organization are located, rarely will this individual point to himself. This perceptual defense mechanism keeps us from taking the initiative, and thus, we must all look to ourselves and evaluate from an objective viewpoint. Quality Circles are the vehicles which allow us to solve our problems.

The behavioral science concepts of Quality Circles educate us regarding interpersonal relationships, and the statistical quality control techniques train us in the tools to solve problems [26]. The researchers believe that this dire need for training in behavioral science concepts and statistical quality control is the reason that the factor "training" was identified as the second most significant factor in a successful Quality Circle process.

The research indicates that without the needed training and results, it should not be surprising to have a lack of management support. But well developed introductory seminars should at least afford management's willingness to try the program on a trial basis, i.e. acceptance [26].

To obtain this acceptance, the introductory seminar must show management that their perspective is understood. The top executives examine the external environment to determine what must be done to adapt their goals and organizational

objectives to that environment. These goals and objectives place demands on their organizations and people at the lowest levels respond to these demands. Quality Circles give these groups at the lower levels the vehicle to respond. But the crucial activity in this process is middle management's answers to the responses from the lower levels. This is why active middle management participation with the Circles is vital to the success of a Quality Circle process, and this is also why management Quality Circles for all levels of management are indicated [26].

However, Quality Circles do violate the sense of history that has bred the defeatist attitude about new programs usually expressed as, "here we go again." Unfortunately, this attitude is based on real and painful experiences. Quality Circles require commitment of resources, and considering this sense of history, middle managers, the custodians of resources, are reluctant at best to initially support such a program [26].

Management Support. The research shows that the need for total management support is not initially necessary for the success of Quality Circles. You must earn management support. If support is a precondition to starting the process, it will take a long time to become functional. In the face of skepticism and doubt, the process could be started. This will make the coordinators, facilitators, leaders, and members

work harder to be successful. At Honeywell Corporation, a challenge was placed with middle management in order to start their program, but it was not until two years later that the division manager knew that there were active Quality Circles. At present, Honeywell has over five hundred active Circles worldwide [25]. This method of introduction is not recommended, however, introduction may require some innovative thought and action beyond the basic model for implementation that is presented in Chapter 6 of this study. A basic premise is that change of any kind is uncomfortable. Quality Circles ask management to make a change, to adopt new ways of managing people at the lower levels of the organization. We must realize that we are asking for the most difficult of changes, a behavioral modification of authority [26]. Toward this end, it is the critical role of the facilitator to build a strategy and a plan for gaining and sustaining management support. This plan must be comparable and compatible with the implementation plan for the active Circles. This is why the selection of the facilitator(s), especially the initial one(s), is critical to the Quality Circles process. Only when Quality Circles are an integral part of the organization will long term success by possible [26].

Ownership of the process should be available to middle and upper management through participation and involvement. Encouraging these levels to give their Quality Circle efforts a personal touch helps to emphasize each areas' own

unique priorities. Additionally, goal-setting activities and recognition planning further develops ownership. One of the best methods for strengthening ownership is to have a manager, especially a skeptical one, present the Quality Circle concept to people outside of their department or organization. These methods should be actively pursued by the facilitator(s); the steering committee and the Circle leaders should not be allowed to isolate the process from the rest of the organization [26].

The realization of management support requires visible supportive actions of the managers. The facilitator must provide guidance and training to managers in specific support/reinforcement techniques. It would be naive to think that just because a person is a manager they automatically know how to positively interact with subordinates [26].

A key function that will breed middle management support is getting them involved in auditing and evaluating the process. Some type of audit and evaluation, whether qualitative or quantitative, is indispensible to management in order to justify continuing the process. While "sufficient time for results" is one of this study's significant factors, the process must at some time be evaluated. There are many research tools available for both subjective and objective measurement. Many experts express the concern that too many organizational interventions have been overmeasured to the

point of program oblivion. We will discuss measurement later, the point here is to get middle management involved in whatever method is used. This will significantly aid long term support.

Management Understanding. Understanding of the concept may be the last outcome of a Quality Circle process. Management must have a good cognitive understanding of the philosophy and some practical experience also. This experience should occur during the implementation phase with in-depth orientation sessions and training events. This initial involvement will be extended by having middle managers participate in auditing of the process. Management may never fully understand the concepts and philosophy, but as long as positive audit reports continue, full understanding is supplemental.

In summary, Quality Circles must earn management support, it is not necessarily a pre-condition to Quality Circle efforts. The facilitator must realize that it is a critical part of their job to build management support as part of the implementation plan and make this support part of the change process. Also, the facilitator must strengthen management's understanding of the Quality Circle philosophy, find ways to increase management ownership of the process, relate circle activities to perceived organizational goals and needs, and help management make its support tangible and

visible. Finally, the facilitator should assist management in development of on-going evaluation as a critical aspect of long-term Quality Circle success.

Training

Obviously, from our discussion of management support, all the behavioral change, interpersonal techniques, and measurement techniques require a well planned, in-depth training program, especially for the Circle leader(s) and facilitator(s). The researchers believe that the general lack of knowledge of behavioral science concepts and statistical quality control techniques are the reason why training was indicated as the second most significant factor in a successful Quality Circle process.

The behavioral science concepts must be taught to the facilitator(s) and leader(s) along with other techniques. It must be stressed that Quality Circles are behavioral change agents. In the initial phases, the training must be tailored to meet the specific needs of each organization.

Our research suggests that it is not enough to merely train people, they must become skilled in applying this new knowledge. To this end, group dynamics skills are the most important skills for the facilitator(s) and also Circle leaders. It is a grave and common error for management to assume that managers at any level posses the required skills and training to successfully deal with their people and have

productive output. Experts agree that all levels of the organization must be trained in Quality Circles. Circle members, leaders, and facilitators are trained in the specific day-to-day tools and techniques of problem identification, analysis, solution, implementation, and management presentation. At the same time, the steering committee and as much of management as possible are taught the philosophies and concepts behind Quality Circles, and what they can do to assist the Quality Circle process toward long-term success. To this end, the facilitator is further trained in how they can successfully assist management in accomplishing a supportive and encouragement role. Consequently, the facilitator's training produces the brain of the Quality Circle process and the vital link between the Circles and upper management.

A logical extention of all this is to train management so that they may conduct Circles at their levels; there's really no reason not to have management Quality Circles. Our research shows that many companies with active Quality Circle processes have instituted management Circles quite successfully.

A further extention of this is the recurring training phase. Not only are Quality Circles an iterative process, but the training phase is also iterative.

The initial training program is composed of separate manuals and audio-visual training modules for the facilitators, Circle leaders, and Circle members. There are also audio-visual training modules for management orientation.

Our research has shown that the main difference between Quality Circles and other organizational interventions is the in-depth, multi-level training process. Dr C. C. Crawford, professor emeritus of the University of Southern California, states that he has surveyed thousands of individuals while teaching his "Crawford Slip Method," and he finds a consensus that people in general feel that they are not adequately trained [15].

Even though Quality Circles have a formal training program, the beauty of the concept is that it can and should be adapted to each individual organization or department. This will further insure that Quality Circles become an integral part of the organization [26].

Finally, we must understand that the employees are learning new behaviors and approaches. There will be stress associated with this, and they must learn to manage and handle this stress [47].

Voluntary

Although this factor was ranked third, a Quality Circle process that does not adhere to complete voluntarism will probably not be successful. Our research shows that Volunteerism is another of the key factors which sets Quality Circles apart from most every other organizational intervention. This is one of the most difficult rules to follow because it is not the usual manner in which business is

conducted in industry or any other kind of management agencies. However, it is the one sure way to convince Quality Circle members that the process is for their benefit, not just another management imposed program.

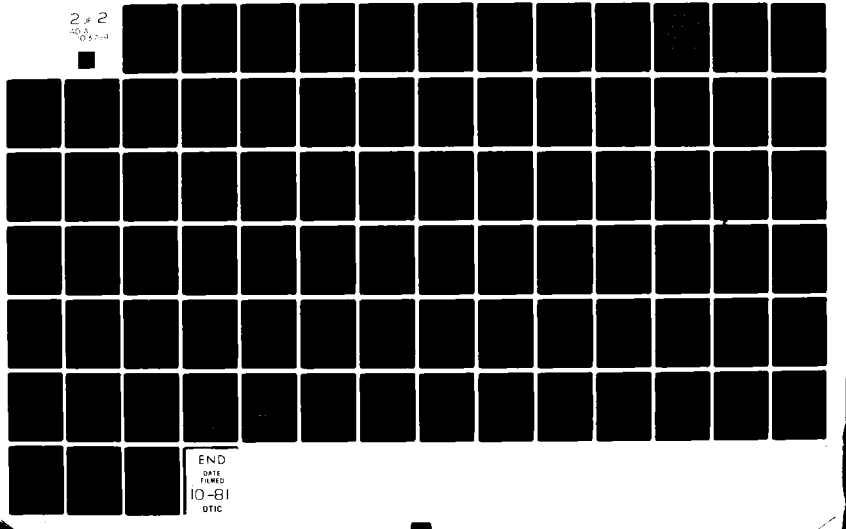
Not only is the program voluntary for the members, but it must be voluntary for all participants, including the leaders and managers. Of course, problems may develop because of this rule, but they can be resolved in time. An example problem situation could occur when a supervisor may volunteer to become a Circle leader, but the manager above him may not want Circles in the department. The facilitator then tries to convince the manager to give it a try. If that is not successful, it may be necessary to wait a while to get tangible success stories from other Circles to change the manager's mind. This usually does cause a change of mind [47].

In contrast, a leader may become so enthusiastic that there is a desire to have the entire work group participate in Quality Circles. However, it is still essential to maintain volunteerism at all levels of the organization. If employees are pressured in any way into participating, the group will resent it and Quality Circles will become another management edicted program [47].

For the above reasons, our study suggests that an organization starts their Quality Circle process on a small scale to insure that only genuine volunteers participate in

AD-A103 784 AIR FORCE INST OF TECH WRIGHT-PATTERSON AFB OH SCHOOL--ETC F/G 5/9
QUALITY CIRCLES: DETERMINATION OF SIGNIFICANT FACTORS FOR SUCCE--ETC(U)
JUN 81 R E STEVENS, R L MOORE

UNCLASSIFIED AFIT-LSSR-21-81 NL



END
DATE FILMED
10-81
DTIC

the pilot program. As the successes of the initial Circles are publicized, more volunteers will surely wish to participate in the process.

People Building Philosophy

A logical extention of voluntarism is our fourth ranked significant factor, emphasizing a people-building philosophy. Some experts integrate this factor as a part of the general term management support. However, management could be supportive for purely selfish reasons. Thus, a separate factor is necessary, and cited fourth, to emphasize the true aim of the Quality Circle process. It must be understood that the real aim is to train and develop Quality Circle members so that they might apply their knowledge to contribute towards the objectives of the company in producing higher quality products or services through pride in their work and in themselves. Although the focus is on solving quality-related problems, the underlying effect is that the Circle members become more contributing individuals in all aspects of their work life, resulting in a more productive and successful company. As a result of this, the employee develops a personal committment to their work and their lives are enriched. It must be emphasized, however, that this is not a feel-good program; it is a business venture for all parties concerned. But the rewards are well worth the effort [10].

Additionally, a people building philosophy will encourage creativity. Within the Quality Circle training, techniques are included which explain the proper ways by which the most creative ideas are allowed to surface without fear of ridicule. Only in a trusting, non-threatening atmosphere will people be able to think creatively. Management is very good at being idea killers. It is easy not to listen to people, just as it is easy not to do Quality Circles. Management has to stop exploiting people and realize the creative intelligence potential of all employees [20].

Sufficient Time for Results

Quality Circles should never be introduced as a fast-payback investment. Our study has shown that Quality Circles is a long-term process that requires formal training, patience, and trust. Years of mistrust and stiffling of creativity do not dissipate overnight. Of course, there are exceptions; some Circles have solved problems even before they are finished with the initial training phase.

Although the methods of measurement should be decided within the implementation plan, and small scale progress and audit reports could be accomplished early in the process, a formal evaluation of the entire pilot program should not occur for at least one year [10]. In an extreme case, Quality Circles were functioning at Honeywell-Clearwater, Florida for two years before the division manager ever knew they existed [26].

Of course, this method is not suggested but is referenced here to illustrate that sufficient time be provided for results. The nationwide average for return-on-investment, given sufficient time, is three-to-one [9]. In Chapter 6 of this study, suggested quantitative methods of measurement, as well as affective measurement factors will be presented as part of the implementation plan.

Communication

One of the important purposes of an organization structure is to expedite the processes of communication [32:317]. For this reason, Quality Circles use the existing structure of the organization and train employees in how to obtain and maintain results from the existing channels of communication. Circles provide open channels of communication through all levels of the organization. The lower levels are trained in how to communicate their ideas properly in a management presentation; and the upper levels of management are taught an improved structure for their communication which keeps subordinates up-to-date on information that affects their jobs. Our study has shown that Quality Circles afford employees a continuing opportunity to learn about management's objectives, and hopefully shape personal goals that are congruent with the organization. Finally, to complete the loop, Quality Circles provide

management with enlightened feedback from subordinates who were previously unable and untrained in how to speak management's language [47].

Team Effort

Any assembled group will have individuals able to dominate others. Our study showed that with proper guidance and encouragement from the Circle leader, the more dominant members will begin reaching out to help the "silent" members. Eventually, the Circle will have a team-like feeling where everyone is looking out for everyone else. This climate will carry outside the meeting itself and will become the natural way in which the group works in the future. Of course, this is what Quality Circles are intended to do. Quality Circles is not just a one hour per week meeting. It is a participative, cooperative way of operating and management. Our study has shown that a further method of encouraging this cooperative feeling is to be sure that the problems a Circle decides to work on are the problems that the whole Circle gets involved in solving. The Circle leader must protect against just one individual working on a problem to the exclusion of other members. This does not mean that some members won't be more active than others, nor that they should not be allowed this greater activity. Nor does it mean that there won't be times when a small part of the Circle (a mini-Circle) may be working on a particular phase of

a problem. It does mean that the feeling should be encouraged that this is a team effort, and the team shares in the recognition and satisfaction for having solved a problem [47]. As a result, true synergism will evolve, where the whole is greater than the sum of the parts.

Participation

Initially, participation is meant to refer to the Circle members being assured a chance to be heard. This is closely tied in with the team effort factor discussed above. Our study has shown that through meaningful participation in the Quality Circle process, the Circle members gain a sense of ownership of the process. But ownership must also be extended to management, also through meaningful participation.

Management participation and a sense of ownership ties into long-term management support. As stated earlier, this sense of ownership can be gained in at least three ways. The first is involving management in the auditing process of Quality Circles. Secondly, the facilitator(s) should assist management in ways to publicize the process and to actively recognize the participants, both formally and informally. Third, managers should be encouraged to introduce the Quality Circle concept to areas outside of their own department or division. This third method has been found to be the best way to breed a sense of ownership within management [26].

Recognition

This factor also ties directly into management support. As our study has indicated, through active, visible recognition by management the Circle members are reassured that management does in fact trust the workers, that management appreciates what subordinates are doing, and subordinates are encouraged to work for long-term survival of the company and success of the Quality Circle process, that is, goal congruence.

Members of a team continually encourage each other through verbal and formal support. Through management's recognition and encouragement, this sense of team effort, in the form of a Quality Circle process, will pervade the entire organization. The effects of this can only be overwhelmingly positive.

There exists a common idea that Quality Circles could be tied in with an existing suggestion program. There is a grave danger in this idea that must be avoided. Our study suggests that any and all recognition should always be given to the Circle as a whole; there should never be individual payments or individual recognition of any kind. This would destroy the team concept, and breed dissention and eventual ruin of the entire Quality Circle process. As long as individual recognition is avoided, then Quality Circles could and have been successfully integrated into a company's already existing suggestion program.

Work Related Projects

Our tenth significant factor is just as necessary as the other nine for a successful Quality Circle process. Our study has shown that the theory of Quality Circles is that the people who actually do the work are the ones who really know and understand what the problems are. They have to live with those problems all day long, day in and day out. They are the experts concerning those problems. However, it often happens that when a Circle embarks upon selecting a problem or a theme to work on, they select a problem caused by some other external organization or group. Obviously, they are not the experts about what is causing the other organization to create the problem. It seems to be true that people find it more difficult to work on correcting their own mistakes, and much easier to tell others how to correct their mistakes [46].

Our research study indicates that it is important that the Circle be given proper guidance and advice about selecting the problems they are to work on. They should be encouraged to first look at their own mistakes before dealing with externally caused problems. The facilitator is trained in how to deal with these situations and can assist the Circle leader.

Summary

The ten most significant factors identified by the survey have been analyzed. Research indicated that a lack of any one of these factors will eventually cause the demise of a Quality Circle process. Each factor integrates into the others to form an iterative process that is both formal and flexible enough to adapt to any organization. In the next chapter, a general model for introducing and implementing Quality Circles is presented.

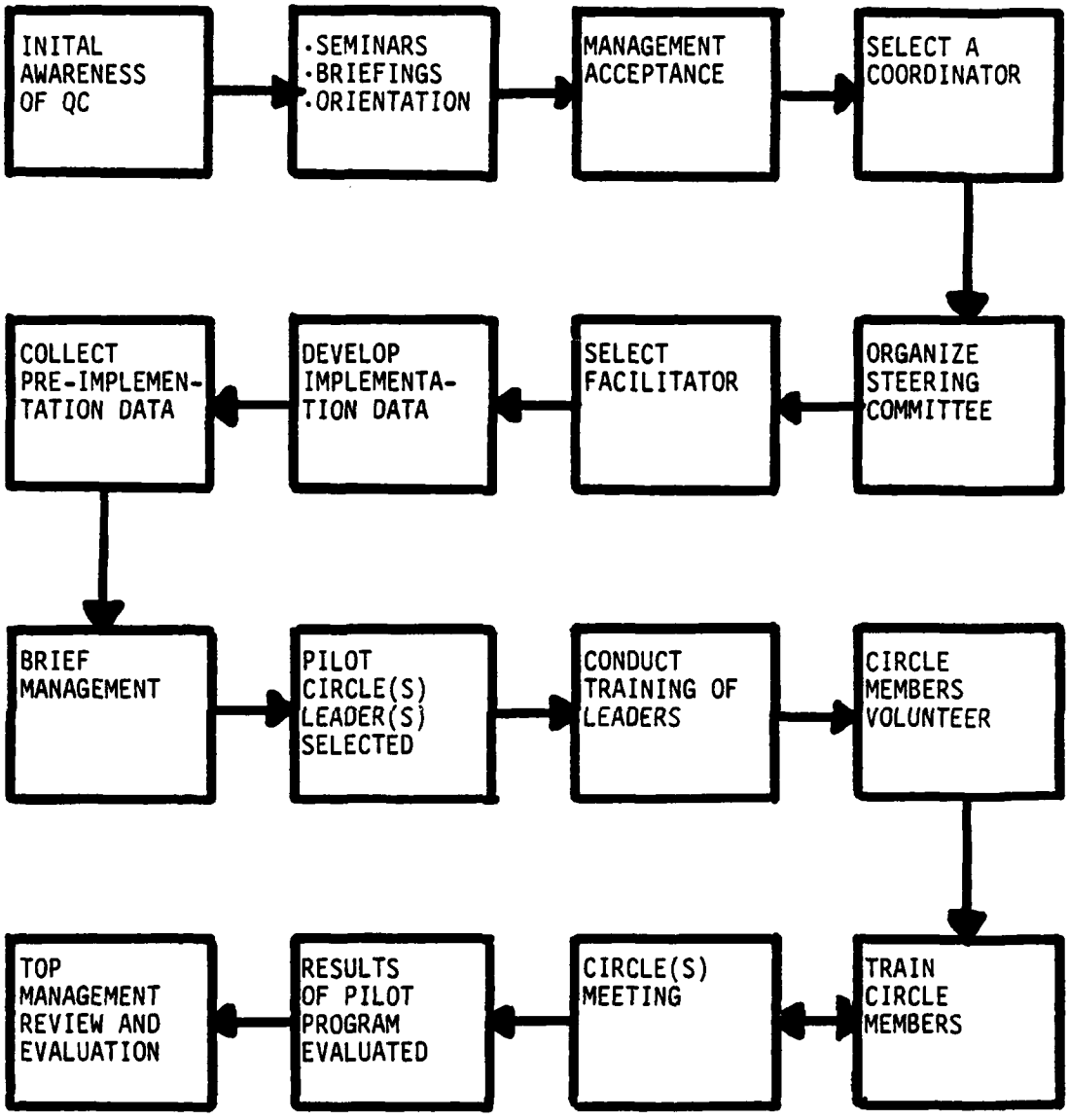
CHAPTER 6

GENERAL MODEL FOR IMPLEMENTING A QUALITY CIRCLES PROCESS

In this chapter the authors will present a model that outlines how Quality Circles should be introduced to an organization. This model is the result of detailed data collection through telephone interviews, personal interviews, literature reviews and attendance at the 3rd annual conference of the International Association of Quality Circles. The model, as seen in figure 3, page 90 , outlines the flow process of the necessary general steps that should be taken in order to introduce Quality Circles to an organization. Each of these steps will be explained in detail.

Initial Awareness

The authors generally found two methods in which organizations initially become aware of Quality Circles. First, an employee of the organization becomes aware of the concept by accident, gathers as much literature as possible, and then introduces Quality Circles to the rest of the organization. Second, an organization desiring to improve quality and productivity visits a similar organization which already has active Quality Circles. This visit usually stimulates the observing organization to investigate and initiate a Quality Circle process.



GENERAL MODEL FOR IMPLEMENTING A QUALITY CIRCLES PROCESS

Figure 3

Seminars, Briefings, and Orientation

After initial awareness, the next step is to begin introducing the concept to management through seminars, briefings, and orientation sessions. It is vitally important to openly include union representatives in all activities at this point in Quality Circle process implementation. This open introduction is essential to first, alleviate the skepticism inherent with any new program, and second, to assure all concerned that the Quality Circle process poses no threat to anyone's authority.

The first sessions are only about one hour in length with the next sessions lasting an entire day. Top management should be the first to receive this sequence of introductory briefings, followed by the briefings being given to middle management. Just like the entire process, this introductory phase should not be rushed. As the survey results showed, management support is the most important factor inherent in a successful process. However, as we discussed in Chapter 5 of this study, management acceptance is all that can be expected during the introductory phase.

Management Acceptance

Although management support must be earned with results over sufficient time, there is an abundance of documented dollar savings and enthusiastic testimonials that should convince even the most skeptical management to give

the Quality Circle process a try. Providing supporting literature to the skeptics for study on their own time will help convince them that this concept is honestly aimed at tapping the most important resource -- people.

Further, the researchers suggest that the organization obtain information and literature from a similar organization. This will assist in accomplishing the next phase of the process, selecting a coordinator.

Select a Coordinator

The coordinator is either the person who will be the resident expert within the organization, or a consultant hired to introduce Quality Circles to the organization. We will first discuss the consulting firm.

The researchers suggest that using a professional consulting firm, recommended by an organization similar to the intended, is the best option for initiating a Quality Circle process. There are many sound reasons for this method.

First, the recommended consultant has the most experience in adapting Quality Circles to an organization. This type of coordinator not only provides the necessary tools needed to initiate the program, but the expertise in how best to use them for the particular organization. A consulting firm must be able to do much more than merely make presentations to management, teach facilitators, and instruct Circle leaders. Consultants must take the time to insure that the

training materials and aids they must leave with the organization are fully understood and that the organization knows how it will adapt these new tools and techniques to the unique situation of that organization. There must be no gap between what is taught by the consulting firm and the situations to which Quality Circles are to be applied. It must be clear and openly emphasized that the Quality Circle process belongs to the organization, not to the coordinator [26].

There are certain disadvantages in having the first facilitator be the coordinator. In the case of the facilitator being selected from within the company, error in selecting the right person will cause eventual demise of the Quality Circle process. A facilitator must possess many specific characteristics that will be discussed later in this study. The point is, the person should not be selected on the basis of enthusiasm alone, although enthusiasm is important. At this early stage of the process there is no steering committee to objectively select a facilitator.

Secondly, the facilitator training courses offered do not provide sufficient time for one person to fully comprehend and absorb the expertise necessary to facilitate an entire Quality Circle process. For example, the facilitator training course conducted by IAQC is only four days long. Then, this person must bring back the entire organizational training package, manuals, audio-visual material, etc., and begin applying this new knowledge possibly before understanding it fully.

The method of hiring a full-time initial facilitator from outside the organization combines a disinterested party with the lack of repeated professional introduction of Quality Circles. Although this method has worked in isolated cases, this is the least used method.

The researchers found that the safest method for introducing Quality Circles is through the use of a recommended consulting firm providing experts to serve the coordinator roles. "Recommended" is stressed because similar organizations who have used the consultant can give the initiating organization an excellent performance perspective of the consultant's past record. Here, as in the entire process, the key for management is to go slow.

In summary, an organization should ask four questions of a candidate consulting firm. First, how many Quality Circles has the candidate had hands-on experience? The answer should be at least ten. Second, how many years has the candidate had hands-on experience with Quality Circles? The answer should be at least two. Third, what kind of training packages is the candidate going to leave behind? To answer this question, a comparison with other candidates should be made. Fourth, can the candidate provide a list of satisfied customers? Contacting these past customers is an important step in order to gain a complete perspective of what the candidate is offering can be evaluated. The surest way to kill a Quality Circle process is to employ a shoddy, disreputable consulting firm [87].

Organize the Steering Committee

Operationally, the steering committee is the most important element of a successful Quality Circle process; this, of course, is part of management support [8,5]. The steering committee provides overall guidance and direction for Quality Circle activities [8,6]. Steering Committee members are representatives from the major departments within the organization, such as, manufacturing, finance, marketing, engineering, and the unions. The most important factor for these managers is they voluntarily wish to join the steering committee because they are interested, and not because they are coerced or ordered to participate [10,1]. These representatives from each major function do not have to be at the top levels of their respective functions. They can be line or staff managers, as long as they are part of management. This is why the initial orientation sessions must include as much of each major function as possible. With this approach, it is quite likely to find managers interested in becoming members of the steering committee.

Consequently, the levels represented by the steering committee members should vary from middle to executive level personnel. This method of manning the steering committee provides visible support for the Quality Circle process throughout the organization, affords all levels of the organization a voice in the Quality Circle process, and accomodates

personnel mobility within the organization without negatively affecting support for the process [8].

The steering committee is analogous to a board of directors, but, with the added feature that not every member occupies the highest level of each major function. The committee is responsible for establishing policies, procedures, objectives, and resources; they provide guidance and direction to the Quality Circle process; they publicize Circle activities within and outside the organization. Further, widespread visibility is accomplished by regularly meeting with and selecting new facilitators, and attending the management presentations of the Circles. Many organizations have a head facilitator or overall, permanent coordinator who assists the steering committee in performing their duties. In many companies, the facilitator is either a member of the steering committee or the assumed chairman of the steering committee. The reader is referred to Appendix B for a detailed list of the duties/responsiblities of the steering committee.

Select the First Facilitator

The facilitator is the individual responsible for coordinating and providing the key communication link between the Circles and management. This person is also responsible for training the Circle leaders and members, and consequently must be the resident expert for the organization. Normally,

the first facilitator becomes the head facilitator or coordinator for the continuing process; and in many organizations, the assumed chairman of the steering committee.

The facilitator is on staff and reports directly to top management. The researchers found unanimous agreement among the experts concerning the four most important attributes that a facilitator should possess. The four attributes are: 1. self-starter and well organized, 2. cares about people and can stimulate them, 3. believes in participative problem solving, and 4. comfortable with both employees and management [49:15].

According to Don Dewar, president of Quality Circle Institute, the facilitator should not be picked or appointed, but should be selected on the basis of competition [25]. Dewar states that the position of facilitator is so critical, that selection should not be taken lightly by either the steering committee or the candidates.

Organizations vary concerning the amount of time required of each facilitator. It is recommended that the facilitator's duties be treated as a full time assignment so that the facilitator may devote full attention to making Quality Circles a success. This full time role will also help to prevent "facilitator burn-out." Burn-out is the condition where frustration, too many duties, and anxiety

concerning success cause a person to cease caring about their duties. The surest way to eventually kill a Quality Circle process is to allow burn-out to occur.

In contrast, some organizations have part-time facilitators, and a Hughes Aircraft representative stated that his company assigns a facilitator to each and every Quality Circle. Although the above two procedures are not recommended, each organization should evaluate their own situation and use whatever methods bring long-term success.

Develop an Implementation Plan

The most important task for the steering committee is to formulate an implementation plan specifically geared to the organization. The plan is normally formulated after consulting members at all levels of management [24].

The implementation plan should include:

-Purpose and Objectives of the program

-Rewards and Recognition procedures

-Ground Rules

-Funding Sources

-Controls

-Restrictions

-Reporting Structures

-In what part of the organization Quality Circles will be initiated

-How Quality Circles will be measured (pilot program and long-term should be separate)

-Training sequence for participants

-[10].

In essence, the implementation plan should design the program to meet the needs of the organization, and should include planned growth of the Quality Circle process. Also, the steering committee should avoid "tunnel vision" in its perspective. Innovation and committment to the change agent, the Quality Circle process, should permeate all aspects of the implementation plan [59].

The implementation plan must recognize Quality Circles as a change agent. But, it must also deal with natural resistance to the redefinition of roles and there must be a willingness to breakdown the barriers of communication. In addition, there must be a plan for long-term involvement and commitment, as discussed in Chapter 5 -- Management Support [54]. See Appendix C, page 126 for a sample implementation plan.

Collect Pre-Implementation Data

Before initiating Quality Circles, baseline data should be compiled to substantiate future audits and evaluations of the Quality Circle process. These baselines can be: present quality level, cost of rework, scrap costs, labor costs per unit, manhours per workorder, production volume, levels of services rendered, and other measures [24].

However, it must be cautioned that too much measurement too soon may have definite negative effects upon progress. Management must not drift away from the people-building

philosophy, or degrade the process by over-emphasizing return-on-investment. Many organizations use purely qualitative methods to measure their pilot Circles; and then after sufficient time, begin quantitative measures. The qualitative measures have varied from, employee enthusiasm to testimonials from the pilot Circle leaders. Also, as the results of our survey indicate, sufficient time for results is the fifth ranked significant factor inherent within a successful Quality Circle process. The consensus time that should be allowed is one year [10].

Brief Management

It is a grave error, especially during the initial phase, not to inform management concerning the progress of implementation. This phase should bring management's approval for implementing Quality Circles. Also, there may be some management personnel who were not directly involved in the initial Quality Circle activities. These individuals should also be briefed on progress and future plans.

Management briefings at this phase of the process will begin to alleviate many fears of threatened authority, and begin to develop management support [89].

Select Pilot Program Circle Leaders

Perhaps the most difficult task of this model is selection of the pilot Circle leaders. Management has their

views of first line supervisors, and the workers may have quite divergent views from management. Consequently, unseen animosity towards the supervisor may hinder the Quality Circle process. This is true because the Circle leader assists in training the Circles and, of course, leads the Circles after the training phase. It would be awkward for the work area if the Circle leader is not the first-line supervisor or foreman. However, some Circles have one of their peers as a leader.

Added to the above, the pilot Circles are normally analyzed more critically than Circles in a maturing process. Thus, the pilot Circle leaders must be selected after critical analysis of the initial group of trained leaders to determine the best five or six individuals. This is the recommended number of initial Circles to assure that the process of adapting Circles to the organization is not overburdened by too many Circles. The initial cadre of Circle leaders must be the best leaders.

The Air Force defines leadership as, "the art of influencing and directing people in a way that will win their obedience, confidence, respect, and loyal cooperation in achieving common objectives [14:52]." Thus, the leader must seek out methods of influencing others to secure the best results with the available resources. Add to this, that the Circle leaders must receive the best training available, especially in behavioral science concepts.

Just as the facilitator(s) must possess certain attributes, so too must the Circle leaders. Among the needed attributes are: integrity of character, sense of responsibility, professional competence, enthusiasm, emotional stability, positive human relations attitude, self-confidence, and pride in personal appearance [75].

According to J. F. Beardsley, the greatest long-term benefit of Quality Circles is changing the role model of the first-line supervisor. Whether this supervisor is the Circle leader or not, Quality Circles will build a supervisor/relationship in which, if it was a task-master/adversary relationship, it will evolve into a supportive, trusting and mutually beneficial relationship [70].

Conduct Training of Leaders

Chapter 5 of this study indicates that training is the second most important factor necessary for a successful Quality Circle process. Although this block is geared toward Circle leader training, any other personnel wishing to gain detailed knowledge of Quality Circle tools and techniques should be encouraged to attend leader training. These additional attendees should not only include management, but also union representatives in order to provide them an understanding of the Quality Circle process [25].

Further, chapter 5 indicates that the initial training sessions for leaders should include group dynamics, the

training of adults, motivation, leadership, communication, problem solving, statistics, and behavioral science concepts.

According to Rieker, there are three main objectives of the leader training block: 1. to provide knowledge and the skills necessary to start and operate a Quality Circle process, 2. explain the basic Quality Circle techniques and how they are applied by the leader and members, 3. to show the leaders how to train the Circle members [9:4].

It must be reemphasized that all leaders should be complete volunteers. Rieker stresses that if the leader feels that Quality Circles are a waste of time, or if the techniques are not used, or merely pays lip-service to the process, these attitudes will also be reflected by the Circle members [9:4].

Although many organizations employ outside consulting firms, it is recommended that the new facilitators participate as much as possible in training the new Circle leaders. This will allow the new facilitators an opportunity to apply their newfound knowledge and skills in the Quality Circle process [4:16].

Circle Members Volunteer

As indicated in chapter 5, voluntary participation is the third most important element for a successful Quality Circle process. This phase of the model entails seeking volunteers for membership in a Quality Circle. Initial

publicity for Quality Circles could already have begun by this point through brochures, the company newspaper, or even explanatory letters to employee's. According to Rieker, the first-line supervisors should be consulted for advice and opinions on the best way to introduce the process to their subordinates [9,4]. The various methods of introduction are: a mass gathering of employees in an auditorium, small group orientation sessions, or one-on-one contact. The general trend is the supervisor introduces Quality Circles to the work group. It can not be emphasized enough that this is a voluntary process.

The two extremes of volunteerism present no real problems. If not enough employees in a particular area choose to volunteer, this is no problem. Some other area may initiate the process, and an organization should start small anyway. If too many people volunteer, possibly multiple Circles could be started in one area, but here again, the process should start small. Also, if there is an overabundance of enthusiasm, this can only assist the Quality Circle process; and it is normally a simple task to unoffensively select members for a pilot Circle(s) while assuring the others that their chance will occur very soon.

Train Circle Members

The completeness and time devoted to training is stressed at this point, especially since training is the

second most important element for success of the Quality Circle process. The first four to eight meetings should be devoted entirely to training conducted by the facilitator and Circle leader. According to Howell, the leader should provide most of the training, while the facilitator provides back-up support only when necessary [47:13]. This method will help build the leader/member relationship. It should be reemphasized here that Quality Circles is not a "feel good" program; Quality Circle meetings should be business meetings with agendas and intended outcomes.

The members are taught: brainstorming, cause-and-effect diagrams, pareto analysis, histograms, check sheets, control charts, scatter diagrams, and how to give a management presentation. The specific definitions of these techniques are contained in Appendix D, page

Finally, it should be noted that many Circles begin solving problems even before they are out of the initial training phase. As long as initial training is not impacted, problem solving at this stage should not be discouraged.

Circle(s) Meeting

The Circle members should decide what their meeting schedules should be within the framework of known company workloads. Usually, meetings are held once a week for one hour. But this schedule is flexible, and many Circle members devote time away from the job to Quality Circles.

It is recommended that the facilitator be present during Circle meetings, but should not actively participate in the agenda unless asked. The facilitator should be there to insure that the mechanics of the Circle process are followed [9:4].

There are nine basic steps in a Quality Circle cycle designed for orderly investigation and solution of problems.

The nine steps are:

1. Determine the problem to be attacked, and the reason for selection.
2. If it is a general problem, choose a specific part of that problem and find out everything about it to insure understanding.
3. Analyze the data gathered about the problem in order to determine the true causes.
4. Determine what solutions or actions required to solve the problems.
5. Develop a plan for initiating the corrective actions.
6. Implement the corrective actions.
7. Check to confirm that the actions have been effective, and if the problem is really solved.
8. Set up a system to insure that the problem remains solved and will not recur; standardize methods.
9. Investigate and resolve other aspects of the problem if they are significant, and evaluate if it is cost effective to attack them.

-[47:28].

If this approach to solving problems is used, the prospects for successful Quality Circles will be significantly enhanced. It should be noted that this cycle is an iterative process that should be integrated with recurring and advanced Quality Circle training.

Results of Pilot Process Evaluated

This phase of the model should entail evaluating the results of the pilot Quality Circle process by the steering committee, facilitator(s), Circle leaders, and Circle members. The goals established within the implementation plan and by the pilot Circles are the focus of this evaluation. Because of the short time frame between initiation and this phase, qualitative methods of measurement are recommended. However, many Circles have already generated quantifiable results by this phase.

The success of this phase is highly contingent upon the care in which the original implementation plan was formulated by the steering committee. And, it should be emphasized that overall evaluation of the initial phase should be accomplished by the steering committee. This is recommended because the steering committee is the highest level within the organization having received significant training.

The results should, of course, be widely disseminated throughout the organization; and the report should provide feedback for possible modifications or adapations of the Quality Circle process.

If the report shows any negative results, the steering committee should determine the causes and evaluate possible corrective measures. However, it should be reemphasized that the Quality Circle process was *not* developed as a fast payback return on investment. Although in many cases it does produce quick results, the many change agent factors already discussed in this study require sufficient time for results, and are specifically aimed toward long-term results.

Top Management Review and Evaluation

This is the last step in the model before expanding the Quality Circle process within the targets of planned growth. The highest levels of the organization are formally briefed by the steering committee based upon the results of the pilot process. This step should not be viewed as a surprise to top management. Informal progress reports should have been continually flowing to this level to assist in the slow process of developing and earning top management support and understanding. Not only must the steering committee present the results of the pilot process, but, it would be a grave mistake to not have a plan for further growth already developed. Again we emphasize, this is a business venture that must be planned in order to survive. It is top management's job to evaluate the future; the Quality Circle process must respond to this evaluation with a plan of attack.

Summary

The sixteen steps described in the general model for initiation of a Quality Circles process are not inflexible rules to be obeyed. One of the real advantages of a Quality Circle process is it can be adapted to virtually any organization. The participants in the process must realize that it belongs to them, and any alterations or modifications that seem feasible are encouraged. A sense of ownership throughout the organization is a potent force nearly as intense as the potential creative intelligence of each member of the organization. When the human resource is effectively tapped in a team effort, the synergism which results virtually assures the long-term survival of that organization.

CHAPTER 7

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this research was threefold: 1. to introduce the Quality Circles concept, 2. determine the most significant basic factors inherent within a successful Quality Circles process, 3. present a general model for implementing a Quality Circles process.

Quality Circles, being one form of organizational intervention have as their basis a people-building philosophy; Quality Circles are a marriage of behavioral science concepts and statistical quality control techniques. Statistical quality control techniques were not included in this study because all the techniques that Circle members need to know are included in the training packages and modules. This study has reviewed four behavioral science concepts from which Quality Circles have adapted the best aspects of each. The four concepts are: Participative management, Job Enrichment, Team Building, and Goal Setting. Quality Circles differ from other organizational intervention programs in that Quality Circles are an iterative process with no termination point, in contrast, a program has a beginning and an end.

Quality Circles restore a critical but long since removed dimension -- the opportunity to think, to commit one's mind as well as one's hands to the job.

The most significant factors inherent within a successful Quality Circles process were identified by a survey conducted at the third annual IAQC conference in March, 1981. The analysis of each of these factors, presented in Chapter 5, was possible through interviews with and writings of a significant majority of the consensus experts within the United States.

The general model for implementing a Quality Circle process was developed by the researchers in an effort to provide clarified guidelines gathered from a multitude of uncoordinated published and unpublished writings. The model intentionally contains flexibility because only the organization itself really knows what is the best way to adapt the Quality Circle process.

Wayne S. Rieker, president of Quality Control Circles Institute, suggests many factors for measuring Quality Circles. Rieker sums up his findings by presenting affective and measureable factors presented in Figure 4 below:

Figure 4
Quality Circles General Areas
of System Impact

AFFECTIVE FACTORS	MEASURABLE FACTORS
Job Satisfaction	Productivity
Peer Communication	Down Time
Improved Management Skills	Reduced Overtime
Develop New Leadership	Cost Avoidance
Customer Satisfaction	Less Absenteeism
Loyalty	Less Personnel Turnover
Motivation	Less Rejects -Scrap -Rework >Defects
	Lower Warranty Costs
	Fewer Recalls

-/94/.

Conclusions

Problems with Quality Circles. The researchers found unanamous agreement among experts that Quality Circles are not intended as a panacea or cure-all for any organization. There are many Quality Circles that become ineffective or fail to accomplish anything positive. In most of the failures, one or more of the basic concepts of Quality Circles have been violated /T18/. Some of the most common reasons why Quality Circles fail are listed in appendix E., page 134. Consequently, there exists some generally accepted Do's and Dont's of Quality Circles. The most important ones are listed below:

DO		DON'T
Broaden ownership to all participants	vs	Control by Management
Establish long term goals	vs	Look for Quick fix magic
Adapt the Process	vs	Ignore the process
Involve the unions	vs	Dictate to the unions
Involve management	vs	Assuming management support
Research the process	vs	Rely on a one day seminar
Plan for implementation	vs	Jump into it next month
Communicate broadly	vs	Keep it a secret
Train management	vs	Exempt management

-/35/.

Quality Circles in the Public Sector. For the most part, Quality Circles in the public sector is not much different than the private sector. However, there are real differences. The government has more regulations than industry; and industry is motivated by profit, while the government must operate under "no risk" and "cost avoidance" objectives. Further, the government generally views success as "no problems." It is also unfortunate that the government tends to overmanage instead of developing leaders /7_7. The basic differences between leaders and managers are:

LEADERS		MANAGERS
Goal Oriented	vs	Result Oriented
Envisions Mission	vs	Accepts/accomplishes mission
Tolerates Ambiguity	vs	Requires order
Inspires	vs	Depends on systems
Produces/promotes change	vs	Adjusts to Change

-/T187.

The point here is, Quality Circles require a change in management style, especially in the overmanaged public secotr.

Granted, there are deterrents for the public sector manager. If a cost center shows significant improvements as a result of Quality Circles, there exists the real threat that either that budget will be reduced or the manpower levels diminished /T77.

Additionally, many public sector managers believe that Quality Circles will require additional manpower authorizations and funding. In the cases of the Air Force, Navy, and Army, no additional manpower was needed. This is true because Quality Circles are designed to fit into the existing organizational structure. Where no additional funding is approved, the only costs incurred for a public organization are the cost of one hour per week per participant, and the cost of copying the required literature. These costs, for

the public sector organizations already active in Quality Circles, have been charged to the funds available for conducting daily business [77].

Aside from all this, there is a much higher appeal to Quality Circles. Quality Circles make a manager's job easier by providing a somewhat structured way of making the best use of each subordinate's creative intelligence. Also, Quality Circles will result in providing the manager at any level with a more cohesive team of dedicated people, more likely to respond to needs for good quality output, on time, and within the budget. Potentially, Quality Circles can broaden one's knowledge and help in a personal development process making career decisions more likely of attainment [47:147]. This higher appeal is how Quality Circles should be approached, especially for the public sector manager.

An American Perspective. Two Americans, in the 1950's taught the Japanese quality control techniques. Now, America is losing an economic war with Japan and we are desperately trying to catch up with our own techniques. The decade of the 70's was an economic "Pearl Harbor"; the decade of the 80's must be like Jimmy Doolittle's bombing raid on Tokyo, the critical turning point for America. In order to effect this turnaround, we must first understand why Japan is ahead and still surging in many industries, from automobiles, motorcycles,

cameras, watches, and optical instruments to such diverse industries as steel, shipbuilding, pianos, zippers, and consumer electronics.

Exactly what has brought about this resurgence of Japanese dominance is eloquently summarized by the "Father of Quality Circles", Dr Kaoru Ishikawa. He sees that,

> ... although Japan started with the worst quality reputation among the industrial nations, no other nation is so completely unified on the importance of good quality achievement and so eager to discover and adopt the best practices being followed in other countries. Also, the Japanese are avid in training all company levels and functions in modern methods of controlling quality and so vigilant in regulating the quality of exported goods. Nowhere else is there the broad-based sense of devotion and especially, the sense of urgency which is so evident among the Japanese [49:115].

The shocking reality of this statement is that it was a prediction made by Ishikawa in 1966. He closes his prediction with these words:

> The Japanese are headed for world quality leadership, and will attain it in the next two decades, because no one else is moving at the same pace [49:115].

Ishikawa's statement is simple; no other country back in 1966 had a plan, no other country, even today, is anywhere near the pace of Japan and its plan.

So what have Quality Circles done for Japan? Again in the words of Ishikawa:

> Of the utmost importance is the fact that through Quality Circles, the Japanese have made a clean break with a tired, outworn theory which

> plagues the West. This theory is that the company's quality troubles are due to employee indifference, blunder, and even sabotage.
>
> The Quality Circle concept starts with a different set of beliefs, the most important of which is, we don't really know the causes of our quality troubles /49:114/.

From this basic premise, the Quality Circles process, analyzed in the previous chapters of this study, is plugged into an organization and allowed to operate.

What must America do to recapture our momentum? "The real challenge, is not to be so overwhelmed by the seeming immensity of what lies before us, that we are defeated by our assumptions about the problem. We tend to be blind to our own assumptions when we are locked inside them. Man is limited not so much by his tools as by his vision /84:147."

What America must do can be thought of in terms of an Air Force slogan, "Fly and Fight"; for America, and for the Air Force, the economic war can be attacked with a mission slogan, "Plan and Fight". Our country, each organization within it, must have a plan to reverse our sagging productivity.

Quality Circles have seen phenominal growth in America within a very brief span of time; hopefully Circles will help change the ruinness path our country is following. Quality Circles are not the definitive answer or panacea for all that

ails American industry. But, if Circles instill an awareness that a change is desperately needed in our corporate perspective, this will be a monumental accomplishment.

> Today, world competition poses an organizational challenge that cannot be met simply by technology or financial resources. Technological innovations and resource allocations are outcomes of human processes. Our ability is to organize human beings in such a way as to generate opportunity and results, rather than impasses, stagnation, bureaucracy, and wasteful friction. A preponderance of American companies seem bound by a managerial scope that limits their potential significantly. We have little reason to be smug about past accomplishments. The present rebukes us too much. There has to be a creative movement. A society in a changing environment is doomed if it does not produce managerial innovations which break inherited molds of perception and old patterns of behavior. At the same time, our technological advances have been tremendous and our formation of capital enormous. Western organizations run themselves in 1981 in much the same way as in 1940. We still esteem the tough, individualistic, and dominating U. S. leadership ideal that prevailed in past centuries. Our world has changed, our society has changed, but our assumptions about management have ominously stayed virtually the same /84:217.

Where should American management look for suggestions? Quality Circles are just one concept that allows evolutionary change. The researchers found others; one of the most current is the concept of "Theory Z" management developed by Dr William Ouchi, Professor of Graduate Management, University of Southern California. Theory Z is based upon three lessons; trust, subtlety, and intimacy relationships between people /81:57.

Recommendations

The researchers recommend that solid empirical research be conducted in Quality Circles. An excellent opportunity for empirical research exists at Homestead AFB, Florida. A Quality Circle process was implemented in September, 1980, within the Civil Engineering Squadron after a formal Job Attitude Survey was administered as a premeasure. In addition to this subjective measure, data for objective measures are being compiled by the facilitator, Mr Chuck Edmonson, a certified industrial engineer. The initial Circles should be ready for postmeasurement by September, 1981. Conducting this empirical research is recommended because the authors found a profound lack of empirical research in the literature search for this study.

Specifically for the Air Force, the words of AFM 1-1 should be heeded: "The most important element of the aerospace force is people /T13:3.57." These words are echoed by former Chief Master Sergeant of the Air Force, Robert D. Gaylor, "If a leader will take care of the people -- provide support, motivation, discipline, and communication -- the people will take care of the mission /T13:3.57."

The researchers further recommend that an organization which becomes aware of Quality Circles should accept the phenomenal success stories as conditional proof that Quality Circles should at least be given a test.

Hopefully, this study has successfully explained Quality Circles, and our brief parting recommendation to any organization considering Quality Circles -- start small, go slow ...

APPENDIX A

INFORMAL SURVEY FOR A MASTERS THESIS EFFORT AT THE AIR FORCE INSTITUTE OF TECHNOLOGY (AFIT)

Appendix A

INFORMAL SURVEY FOR A MASTERS THESIS EFFORT

AT THE AIR FORCE INSTITUTE OF TECHNOLOGY (AFIT)

1. What organization do you represent (optional)_____ .

2. How many Quality Circles do you have knowledge of with respect to progress and accomplishments of those Circles?_____

3. In your opinion, what are the most significant basic elements necessary for a successful Quality Circle program? (Please rank order your answers - 1 is highest)

1._____

2._____

3._____

4._____

5._____

6._____

7._____

8._____

9._____

10._____

(not necessary to list 10 elements)

Thank You,

Please return this survey to your hotel front desk, or to Capt Bob Stevens or Capt Bob Moore.

APPENDIX B

TYPICAL DUTIES/RESPONSIBILITIES OF THE STEERING COMMITTEE

Appendix B

Typical Duties/Responsibilities of the Steering Committee

* Prepare objectives
* Prepare implementation plan to achieve objectives
* Identify general milestones
* Determine funding arrangements
* Establish qualifications for Facilitator
* Select Facilitator
    * Determine who Facilitator reports to
    * Determine office arrangements for Facilitator
* Schedule familiarization presentations to wide variety of organizations
* Determine what Circles can work on, e.g., Quality, cost, safety, company policy, union personnel, design
* Determine tie-in with suggestions program
* Establish baseline measurements
* Determine publicity approach
* Identify organizations for pilot program
* Decide how organization will learn about Quality Circles For example:
    * Company newspaper
    * Mass gathering in auditorium
    * Letters to home
    * Numerous small group sessions
    * One-on-one
* Determine start dates for pilot circles
* Identify leaders for pilot program

* Meet regularly (minimum once monthly)

* Periodically review program milestones

* Identify who Steering Committee will make report to

* Establish what rewards and recognition will be used (in addition to management presentations) for example:
    * Quality Circle Newsletter
    * Company Newspaper
    * Photos on bulletin boards
    * Pins, plaques, certificates
    * Copy of IAQC Quality Circle Quarterly to leaders
    * Cash awards to Circle groups

* Tie-in with the union

-19_7

APPENDIX C

SAMPLE OF IMPLEMENTATION PLAN

Appendix C

Sample of Implementation Plan

NOTE: The following document is designed to serve as a guideline to the development of one specifically oriented to your organization.

POLICIES & PROCEDURES - QUALITY CIRCLES PROGRAM

1. PURPOSE AND SCOPE

To establish policies and procedures for operating a Quality Circle program. This document addresses itself to:

*Definition
*Objectives
*Organization
*Policy

2. DEFINITION

A Quality Circle is a group of employees, performing similar work, who meet regularly to learn about basic Quality Circle techniques. They apply these techniques to identify problems within their jurisdiction. Analyze these difficulties. and recommend solutions to management. When possible, they will initiate the necessary action to implement the solution. Normally, Circles will consist of from three to twelve employees from the same work area.

3. OBJECTIVES

*Reduce errors and enhance quality
*Inspire more effective teamwork
*Promote job involvement
*Increase employee motivation
*Create a problem-solving capability
*Build an attitude of "Problem Prevention"
*Improve company communications

*Develop harmonious manager/worker relationships
*Promote personal and leadership development
*Develop a greater safety awareness

4. ORGANIZATION

4.1 The Steering Committee will be established and consist of representatives from major departments within the company. Examples are: operations, quality, personnel, education and training, engineering, finance, marketing, and the union. The facilitator is a member as well. The Steering Committee is presided over by a chairman and decisions are reached by democratic process -- one man, one vote.

Steering Committee members may not delegate others to attend meetings for them.

The Steering Committee will meet monthly.

More than half of the Steering Committee members must be present to constitute a quorum.

4.1.1 The primary functions of the Steering Committee include:

*Declare specific objectives for Quality Circles, such as quality improvement, cost reduction, improved communication and etc. Identify those items that do not fall within the charter of Quality Circles.
*Develop an implementation plan & operational guidelines.
*Control the rate of expansion.
*Determine funding arrangements.
*Select the facilitator.
*Select Circle leaders.
*Schedule orientation sessions throughout the organization.
*Arrange for necessary training for the facilitators and leaders.
*Determine the frequency and duration of Circle meetings.
*Determine whether Circle meetings will be during normal working hours or after hours on an overtime basis.
*Provide publicity for Quality Circle activities.
*Establish broad base and encourage growth of Quality Circle activities to encompass all relevant areas of the organization.

*Determine the tie-in, if any, with the company suggestion plan.
*Provide guidelines for the measurement of the Quality Circle activities and monitor the cost effectiveness and progress.
*Arrange, when and if necessary, for outside consulting assistance.

4.2 Facilitators: The facilitator is the individual responsible for coordinating and directing the Quality Circle activities within the organization. The facilitator:

*Is selected by the Steering Committee.
*Interfaces between Circles, staff organizations, and management.
*Is a member of the Steering Committee.
*Maintain appropriate records.
*Executes Steering Committee Policy.
*Is responsible for providing training for new Circle leaders.

4.3 Quality Circle Leaders: provide leadership for the Circles, teach Circle members the Quality Circle techniques, and are responsible for the operation of their respective Circles. The first Circle leader will normally be the supervisor in that area. The leader provides guidance for Circle activities and assures proper communication with management through such means as minutes of Circle meetings, activity reports, and management presentations by the Circle.

5. POLICY

5.1 Employees may volunteer to:

5.1.1 Become members of a Quality Circle in their area. They are also free to drop out if they wish.

5.1.2 Suggest problems to Circles as candidates for analysis.

5.2 Management will:

5.2.1 Be enthusiastically supportive of Quality Circles by:

*Allowing Circles to meet during normal hours. If meetings occur after hours, pay will be at overtime rates. Meetings are authorized for a maximum of one hour per week.
*Encouraging formation of Circles as a way of life in the organization.
*Placing a high priority on and encouraging members to attend Circle meetings.
*Allowing member(s) to attend the meeting of another Circle, when invited to work on a joint project.
*Authorizing and encouraging Circle leader candidates to attend leader training.
*Providing adequate meeting areas, equipment and supplies to assure effective meetings.
*Authorizing selective leader/member involvement at outside conferences.
*Publicizing Circle activities and accomplishments.
*Supporting Circle activities in speeches and presentations.
*Including Circle activities as part of organizational goals.
*Including Circle items in organizational activity reports.

5.2.2 Be participative in Circle activities by:

*Respecting the autonomy of Circles.
*Encouraging the Management Presentation as a vital and essential aspect of Quality Circle activities that provides communication, motivation, and recognition.
*Responding expeditiously to Circle requests and recommendations. When impossible to comply, providing an explanation in detail.
*Implementing approved Circle recommendations with a minimum of delay.

5.2.3 Have the authority to promote and initiate management level Circles.

5.2.4 Have the right and are encouraged to suggest problems and projects to Circles while respecting the right of the Circle to make the final selection.

5.2.5 Have the right and responsibility to verify the cost effectiveness of Circle recommendations.

5.3 Circles will:

*Direct their primary attention to problems and projects under their control.
*Assure that each member has an equal voice: One man, one vote.
*Utilize the Quality Circle techniques as described in their manual.
*Set up schedules for meetings and presentations with due consideration of known company work loads and commitments.
*Select and analyze any problem or project within the scope of the official objectives adopted by the Steering Committee and described within this document.

5.4 Circles will not address subjects identified as being outside their charter. These are:

*Wages and salaries.
*Benefits.
*Disciplinary policies.
*Employment policies.
*Termination policies.
*Grievances and other items covered under the collective bargaining agreement.
*Designing new products.
*Sales and marketing policies.
*Personalities.

5.5 Have the prerogative to accept or refuse problems or projects regardless of the source.

5.6 Identify, analyze, and implement solutions to problems. If management approval is necessary, the Circle will not proceed until it has been obtained.

5.7 Conduct presentations to management regarding specific recommendations, accomplishments and status.

5.8 Attempt to improve communications, harmony, and involvement between all Circle members as well as between other employees.

-87-

APPENDIX D

GLOSSARY OF TERMS

Appendix D

GLOSSARY OF TERMS

1. Brainstorming - An intentionally uninhibited technique for generating to greatest number of ideas for later evaluation and development, using group dynamics.
2. Cause-and-Effect Diagram - A picture composed of lines and symbols designed to represent a meaningful relationship between an effect and its causes.
3. Check Sheets - A form prepared to facilitate the data collection process.
4. Control Chart - Provide indications of stability in a process by mathematical means, not by visual comparison.
5. Histogram - A type of graph which shows the distribution of discrete and continuous variables.
6. Pareto Analysis Diagram - A special form of a histogram, where data classifications are arranged in descending order from left to right to separate the important factors of a study from the trivial factors of a study.
7. Multi-vari Chart - Graphical control charts showing the dispersion in a process over a short span of time and a long span of time.
8. Scatter Diagram - A graph with data points plotted and located according to their values relative to the two axis.

-/917.

APPENDIX E

WHY CIRCLES FAIL

Appendix E

WHY CIRCLES FAIL

1. Treated as a program instead of developed as a philosophy of management and a process.

2. Meetings become ritualistic instead of purposeful.

3. Ownership Problems.
   - A. Outside consultants can displace commitment
   - B. Circle members vs Facilitators (adversary relationship)

4. Management reward system.
   - A. Rapid promotion leaves circle wreckage
   - B. Requires long term stabilization which managers are not willing to allow

5. De-emphasis of problem solving and team building.

6. Used as immediate solution (or scapegoat) to all problems.

7. Great initial attention, then:
   - A. Need meeting time for production
   - B. Meeting room not available
   - C. Management doesn't have time to listen
   - D. No recognition
   - E. No money for projects

8. Organizations are created to handle circles.
   - A. Rigid guidelines, chains of command established
   - B. Goals are not merged
   - C. Put under Quality Control

9. Management Control
   - A. Tells what problems to solve
   - B. How to solve
   - C. When to take new members
   - D. Does not provide critical information
   - E. Appoints members

F. Fails to provide adequate training time
G. Insists on a monetary return
H. Sets time tables

10. Management expects results too soon.

APPENDIX F

EXAMPLES OF COST SAVINGS/BENEFITS

Appendix F

Examples of Cost Savings/Benefits

- An estimated $636,000 is being saved by the purchasing department at Westinghouse Electronics Systems Center, Baltimore, Maryland, because of overshipments by vendors are being returned at vendors expense: This procedure was suggested by a Quality Circle Committee /80:99/.

- At Honeywell, St Petersburg, Florida, which has approximately 130 Circles, savings are documented in actual product cost reductions of over $500,000 - a 6-to-1 return on investment /80:99/.

- General Electric Companies room-air-conditioner plant in Columbia, Tennessee, achieved a $15,000 annual savings by solving a weld-leak problem. This problem was solved by Quality Circles /80:99/.

- A Quality Circle at Northrop, was troubled because bits used to drill holes in titanium, for F-5 fighter planes kept breaking. Solution: change the drilling angle and specify bits made of harder steel. Estimate savings $70,000 in lost time /90/.

- At a General Motors assembly plant in Tarrytown New York, was about to be closed because the plant was plagued by violence and absenteeism. The quality of cars was poor and each year employees filed 2,500 to 3,000 grievances. Since the workers were brought into decision making (QC), grievances fell to about 40 a year /90/.

- At Westinghouse, a materials identification chart developed by the inductive components department Quality Circles, enables assemblers to avoid having to leave their work place to verify process specifications. This idea saved up to $14,000 yearly /80:99/.

- At Lockheed, a circle of machinists determined that installation of travel-dial indicators on four machine tools would increase product quality. Management followed their recommendation and four months later it was found that the indicators indeed increased quality and improved machine efficiency 20%. The results are better products at a savings of 3,000 dollars per year /80:99/.

APPENDIX G

PARTIAL LIST OF ORGANIZATIONS WITH ACTIVE QUALITY CIRCLES

Appendix G

Partial List of Organizations with Active Quality Circles

UNITED STATES GOVERNMENT

COVINGTON AIRWAY FACILITIES SECTORS - KY
DEFENSE LOGISTICS AGENCY - MI
FEDERAL AVIATION ADMINISTRATION - GA
FEDERAL RESERVE BANK - GA
OFFICE OF PERSONNEL MANAGEMENT - IL
UNITED STATES AIR FORCE
- -AIR RESERVE PERSONNEL CENTER - DENVER, CO
- -OGDEN AIR LOGISTICS CENTER - HILL AFB, UT
- -OKLAHOMA AIR LOGISTICS CENTER - TINKER AFB, OK
- -SACRAMENTO AIR LOGISTICS CENTER - MCCLELLAN AFB, CA
- -SAN ANTONIO AIR LOGISTICS CENTER - KELLY AFB, TX
- -WARNER ROBBINS AIR LOGISTICS CENTER - ROBBINS AFB, GA
- -HOMESTEAD AFB, FL

UNITED STATES ARMY
- -DEPOT SYSTEMS COMMAND - (ALL 11 LOCATIONS)
- -AUTOMATED LOGISTICS MANAGEMENT SYSTEMS ACTIVITY - MO

UNITED STATES NAVY
- -CHARLESTON NAVAL SHIPYARD - SC
- -NAVAL AIR REWORK FACILITY - CA
- -NAVAL ORDINANCE STATION - KY
- -NORFOLK NAVAL SHIPYARD - VA

PRIVATE INDUSTRY

AC SPARK PLUG - FLINT, MI
ALCAN - CANADA

AMERICAN AIRLINES
AMERICAN BILTRITE, INC.
AMEROCK - CANADA
AMF - HARLEY DAVIDSON
AMPEX - EL PASO, TX
AMPEX - REDWOOD CITY, CA
AMP, INC. - HARRISBURG, PA
AMP - WINSTON-SALEM, NC
ARMCO NATIONAL SUPPLY COMPANY - TORRANCE, CA
ARMSTRONG CORK - LANCASTER, PA
ARMSTRONG CORK - MARIETTA, PA
A/V LK-NES - DENMARK
AVX CORPORATION - MYRTLE BEACH, SC
BABCOK AND WILCOX COMPANY - BARBERTON, OH
BENDIX CORPORATION - FT LAUDERDALE, FL
BENDIX CORPORATION - UTICA, NY
BOEING COMPANY - RICHLAND, WA
BORG AND BECK DIVISION - BORG WARNER
BROWNIE MFG. COMPANY, INC. - WAVERLY, NE
CAMELEC - PLIMPTON, SA
CAMPBELL SOUP COMPANY - SALISBURY, MD
CARLTON COMPANY - MILWAUKEE, OR
CHRYSLER - HIGHLAND PARK, MI
CINCINNATI MILACRON - CINCINNATI, OH
CLEVELAND RANGE COMPANY - CLEVELAND, OH
CORDIS-DOW COMPANY - HIALIAH, FL
COORS - GOLDEN, CO
C. T. S. - ELKHART, IN
CUTTER LABS - BERKELEY, CA
DAYTON TIRE AND RUBBER COMPANY - DAYTON, OH
DELCO-REMY - ANDERSON, IN
DICKEY-JOHN CORPORATION - AUBURN, IL
DOVER CORPORATION - CINCINNATI, OH
DOVER CORPORATION - MEMPHIS, TN

DOW CORNING CORPORATION
DRESSER INDUSTRIES - FRANKLIN PARK, IL
EATON CORPORATION - AIR CONTROLS DIVISION
EATON CORPORATION - GLASGOW, KY
EATON - SOUTHFILED, MI
EATON YALE LTD.
EES - SACRAMENTO, CA
ELTRA COMPANY - TOLEDO, OH
E. I. COMPANY - IRELAND
ESCO CORPORATION - PORTLAND, OR
FAIRCHILD CAMERA AND INSTRUMENT
FERRANTI-PACKARD LTD. - ONTARIO, CANADA
FIRESTONE - DES MOINES, IA
FISHER CONTROLS COMPANY
FORD AEROSPACE - BEDFORD, IN
FORD CASTING DIVISION - CLEVELAND , OH
FORD METAL STAMPING DIVISION - MI
G. E.-MAJOR APPLIANCES
GENERAL DYNAMICS - EAST CAMDEN, AR
GENERAL DYNAMICS - PONOMA, CA
GENERAL FOODS CORPORATION
G. E.-RACD
GILBAR COMPANY - GREENSBORO, NC
G. K. N. POWDERMET
G. M.-BUICK MOTORS DIVISION - MI
G. M.-DELCO PRODUCTS - MI
G. M.-FISHER BODY - MI
G. M.-OLDSMOBILE - MI
G. M.-PONTIAC - MI
GRACO INC., - MINNEAPOLIC, MN
GTE LENKURT - EL PASO, TX
HAWAIIAN DREDGING AND CONSTRUCTION - HI
HEWLETT PACKARD - PALO ALTO, CA
HEWLETT PACKARD - PENANG, MALAYSIA

HONEYWELL - CLEARWATER, FL
H. P. HOOD - BOSTON, MA
HUGHES AIRCRAFT - LOS ANGELES, CA
HYLSA - MEXICO
INTEL SEMICONDUCTOR - SANTA CLARA, CA
INTER NORTH, INC.
JAMES B. LANSING SOUND COMPANY - CA
J. B. L. - NORTHRIDGE, CA
J. C. PENNY COMPANY - NEW YORK, NY
JOY MANUFACTURING - DENVER, CO
KEENE PRODUCTS INC. - MIDDLEBURY, IN
MARION DRESSER - MARION, OH
MARTIN MARIETTA AEROSPACE - DENVER, CO
MARTIN MARIETTA AEROSPACE - MICHOUD, LA
MARTIN MARIETTA AEROSPACE - ORLANDO, FL
MCDONNELL DOUGLAS CORPORATION - ST CHARLES, MS
MCDONNELL DOUGLAS ELECTRONICS
MCGRAW-EDISON
MEMOREX CORPORATION
MERCURY MARINE
METAL LEVE S/A - SAO PAULO, BRAZIL
MICHIGAN BELL TELEPHONE COMPANY - TROY, MI
MOHAWK DATA SCIENCES - HERKIMER, NY
MORTON CHEMICAL
NARCLIF-THAYER - ST LOUIS, MO
NATIONAL SUPPLY COMPANY
NORTHROP - HAWTHORNE, CA
NORTON COMPANY - WORCESTER, MA
PEABODY FLOWAY
PEABODY MAGNAFLUX
PENTEL OF AMERICA
PERFEX - WASHINGTON, IA
PERKIN-ELMER - NORWALK, CT
PERTEC

PHILLIP MORRIS - RICHMOND, VA
POLAROID CORPORATION
RALPH WILSON PLASTICS - TEMPLE, TX
RCA-CONSUMER ELECTRONICS
RCA-PICTURE TUBE DIVISION
REGO COMPANY
R. J. REYNOLDS TOBACCO - WINSTON-SALEM, NC
ROANE STATE COLLEGE
ROCKWELL INTERNATIONAL - EL PASO, TX
ROCKWELL-POWER TOOL DIVISION - TUPELO, MS
ROCKWELL INTERNATIONAL-SPACE SHUTTLE - FL
SALT RIVER PROJECT - PHOENIX, AZ
S. BENT AND BROTHERS, INC. - GARDNER, MA
SENCO PRODUCTS
SIGNODE - GLENVIEW, IL
SINGER-KEARFOTT - LITTLE FALLS, NJ
S. K. WELLMAN CORPORATION - REDFORD, OH
SOLAR TURBINES INTERNATIONAL - SAN DIEGO, CA
SPECTRUM INC. - CLINTON, MA
SPERRY - WATERBURY, CT
SPERRY-VICKERS - JACKSON, MS
SPERRY WHEELER - WATERBURY, CT
SUNSTRAND AVIATION OPERATIONS
SUPER SAGLESS CORPORATION - TUPELO, MS
SYLVANIA - MUNCY, PA
TELEDYNE SEMICONDUCTOR - MT VIEW, CA
TENNANT COMPANY
TEKTRONIX - BEAVERTON, OR
3M COMPANY - WEATHERFORD, OK
TORRINGTON - CAIRO, GA
TRUTH, INC. - OWATONE, MN
TRW-BEARINGS DIVISION
TURRINGTON COMPANY - SOUTH BEND, IN
UNION CARBIDE CORPORATION

UNIROYAL - GEISMAN, LA
UNIROYAL - MONCKS CORNER, SC
VERBATIM CORPORATION - SUNNYVALE, CA
VICTOR BUSINESS PRODUCTS - EL PASO, TX
VICTORY BUSINESS PRODUCTS - EL PASO, TX
VISUAL GRAPHICS - TAMARAC, FL
WARNER LAMBERT
WATER ASSOCIATES
WESTERN ELECTRIC - SHREVEPORT, LA
WESTINGHOUSE - HUNT VALLEY, MD
WESTINGHOUSE ELECTRIC CORPORATION-DEFENSE ORGANIZATION
WEST PUBLISHING COMPANY
WILLIAMS RESEARCH COMPANY
WILSONART - TEMPLE, TX
WOODWARD GOVERNOR COMPANY
YAZAKI - AUSTRALIA
YORK AUTOMOTIVE - DECATUR, IL

BIBLIOGRAPHY

REFERENCES CITED

1. Adams, Billy J. "Quality Circles at Anniston Army Depot," unpublished technical report, unnumbered, Anniston, Alabama, April 14, 1981.

2. Amsden, Davida M., and Robert T. Amsden. "Problems with Q.C. Circles," The Second Annual IAQC Conference Transactions. February 1980, pp 155-159.

3. Argyris, C. Intervention Theory and Method. Reading, Massachusetts: Addison-Wesley, 1970.

4. "Background Information on Quality Circles," Unpublished readings, The Second Annual IAQC Conference, February, 1980.

5. Baker, H. Kent. "The How's and Why's of Team Building," Personnel Journal. June, 1979, Vol 58, No 6.

6. Bassett, Glen Arthur. A Study of the Effects of Task Goal and Schedule Choice on Work Performance," Organizational Behavior and Human Performance, Vol 25, October, 1979, pp 202-227.

7. Beardsley, J.F., and D.L. Dewar. Quality Circles. San Jose, California: J.F. Beardsley and Associates, International, 1977, pp 180-190.

8. Beardsley, J.F. "Ingredients of Successful Quality Circles," unpublished technical report, unnumbered, undated.

9. Beardsley, J.F. "The Quality Circle Steering Committee," First Annual IAQC Transactions, 1979, pp 59-65.

10. Beardsley, Jefferson F. "Why Should We Do Quality Circles?" First Annual IAQC Transactions, 1979, pp 59-65.

11. Beckhard, Richard. Organization Development: Strategies and Models. Reading, Massachusetts, Addison-Wesley, 1969.

12. Bowen, D.D., and J.P. Siegel. Process and Performance: A Longitudinal Study of the Reactions of Small Tasks Groups to Periodic Performance Feedback. Human Relations, 1973, pp 433-448.

13. Bowers, D.G., and J.L. Franklin. Survey-guided Development: Data Based Organizational Change. Ann Arbor: Institute for Social Research, 1976.

14. Cherrington, David J. The Work Ethic: Working Values and Values That Work. American Management Associations, New York, New York, 1980.

15. Crawford, C.C. "The Crawford Slip Method," Videotaped Seminar conducted at Air Force Institute of Technology, Wright-Patterson AFB, Ohio, October, 1980.

16. Crawford, C.C. Personal telephone interview conducted by Dr John W. Demidovich, Professor of Management, U.S. Air Force Institute of Technology, April 28, 1981.

17. Curhan, Franklin. Personal telephone interview to Headquarters Naval Material Command (OOK), Washington, D.C., 20 April, 1981.

18. Deiner, R.D. Personal telephone interview to the International Association of Quality Circles Headquarters, Midwest City, Oklahoma, January, 1981.

19. DeLonga, P.R. "Logistics Planning for the 1980's," Air University Review, July-August 1970, 21, pp 42-50.

20. Demidovich, John W. "The Crawford Slip Method, "Third Annual IAQC Conference, Louisville, Kentucky, March, 1981.

21. Demidovich, John W. "Introduction to Quality Circles," Unpublished technical report, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, June, 1980.

22. Demidovich, John W. Personal interview conducted at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio, November, 1980.

23. Dowar, Donald L. The International Association of Quality Circles. IAQC, Tokyo, Japan, 1975.

24. Dowar, Donald L. "If Japan Can, We Can," Third Annual IAQC Conference, Louisville, Kentucky, March, 1981.

25. Dewar, Donald L. Personal interview conducted at the Third Annual IAQC Conference, Louisville, Kentucky, March 1981.

26. Donovan, Michael. "Building Management Support," Third Annual IAQC Conference, Louisville, Kentucky, March, 1980.

27. Dorey, Lester E., and Thomas H. Pattern Jr. "Long-Range Results of a Team Building OD Effort," Public Personnel Management, January 1977, pp 22-40.

28. Dyer, William G. Team Building Issues and Alternatives. Addison-Wesley Publishing Co. Inc., 1977.

29. Fallows, J. "American Industry: What Ails It, How to Save It," The Atlantic. September, 1980, pp 35-50.

30. Ford, R.N. Motivation Through The Work Itself. New York: American Management Association, Inc., 1969.

31. Gates, E. "Not by Bread Alone," Air Force Magazine, October 1977, pp 60-63.

32. Gibson, James L., J.M. Ivancevich, J.H. Donnelly. Organizations: Behavior, Structure, Processes. Business Publications, Inc., Dallas, Texas, 1976, pp 317-334.

33. Gibson, Price. "Interrelationship of Quality Circles to Quality of Work Life, "Third Annual IAQC Conference, Louisville, Kentucky, March 1981.

34. Green, Thad B. "An Empirical Analysis of Nominal and Interacting Groups," Academy of Management Journal, Vol 18, No 1, March 1975.

35. Hackman, J.R., and C.G. Morris. Group task, group interaction process, and group performance effectiveness: A review and proposed integration. Technical report No 7, Yale University, AD785287, 1974.

36. Hackman, J.R., G.R. Oldham, R. Janson, K. Purdy. "A New Strategy for Job Enrichment," California Management Review, 1975, 17(4), pp 57-71.

37. Hackman, J.R. and G.R. Oldham. "Motivation through the Design of Work: Test of a Theory," Organizational Behavior and Human Performance, 1976, 16, pp 250-279.

38. Hackman, J.R., and E. Lawler. "Employee Reactions to Job Characteristics," Journal of Applied Psychology. 1971, 65, pp 259-286.

39. Hackman, J.R. "Is Job Enrichment Just a Fad?" Harvard Business Review. 1975, 53, pp 129-138.

40. Hare, A.P. Handbook of Small Group Research. New York: The Free Press, 1976.

41. Herzberg, F., and A. Zautra. "Orthodox Job Enrichment: Measuring True Quality in Job Satisfaction," Personnel. 1976, 53(5), pp 54-68.

42. Herzberg, F. and E.A. Rafalko. Efficiency in the Military: Cutting Costs with Orthodox Job Enrichment. Personnel. 1975, 52(6), pp 38-48.

43. Hines, George H. "Sociocultural Influences on Employee Expectancy and Participative Management," Academy of Management Journal, June 1974, pp 334-339.

44. Hortstman, Lt D.M., and Major J.J. Kotzun. "The Impact of Growth and Social Needs on the Job Enrichment Process" a laboratory experiment, Unpublished masters thesis, LSSR-9-77B, AFIT/LS, Wright-Patterson AFB, Ohio, August 1977, AD A047137.

45. Howell, Weldon D. Quality Circles, unpublished research report, unnumbered. Facilitator. Directorate of Maintenance, Hill AFB, Utah, May 1979.

46. Howell, Weldon D. "Introduction to Quality Circles," Unpublished technical manual, unnumbered, undated.

47. Howell, Weldon D. "Quality Control Circles - An Overview," Unpublished technical manual, unnumbered, undated.

48. Hrebiniak, Lawrence G. Effects of Job Level and Participation on Employee Attitudes and Perceptions of Influence, Academy of Management Journal. December 1974, pp 649-662.

49. Ishikawa, Kaoru. Q.C. Circle Activities. Union of Japanese Scientists and Engineers, Japan, 1968.

50. Ivancevich, John M. An Analysis of Participation in Decision Making Among Project Engineers, Academy of Management Journal, June 1979, pp 253-269.

51. Ivancevich, John M. "Different Goal Setting Treatment and Their Effects on Performance on Job Statisfaction," Academy of Management Journal. Vol 20, September, 1977, pp 406-419.

52. Ivancevich, John M. "A Study of Task-Goal Attributes, Higher Order Need Strength, and Performance," Academy of Management Journal. Vol 20, December, 1977, pp 552-63.

53. Ivancevich, John M. and J. Timothy McMahon. "Black-White Difference in a Goal-Setting Program," Organizational Behavior and Human Performance. Vol 20, December, 1977, pp 287-300.

54. Japanese Union of Scientists and Engineers (JUSE). Proceedings. International Q.C. Circle Convention, Yokyo, Japan, October 16, 1978.

55. Jerdee, Thomas H., and Benson Rosen. "Effects of Decision Performance on Managerial Willingness to use Participation" Academy of Management Journal. December, 1978.

56. Juran, J.M. The Q.C. Circle Phenomenon, Q.C. Circles: Applications, Tools, and Theory, 1976, pp 16-22.

57. Kast, F.E., and J.E. Rosenzweig. Organization and Management: A Systems Approach. New York: McGraw-Hill Book Company, 1974.

58. Katzell, Raymond A., Bienstock, Penney, and Faerstein, Paul H. A Guide to Worker Productivity Experiments in the United States: 1971-1975. Work in America Institute, Inc. New York: New York University Press, 1977, pp 10-30.

59. King, Jill. "Japan Can But We Can't," Third Annual IAQC Conference, Louisville, Kentucky, March, 1981.

60. Krapp, Lee. "Quality Circles as a Part of a Total Productivity Program," Third Annual IAQC Conference, Louisville, Kentucky, March, 1981.

61. Latham, G.R., S.B. Kinne. "Improving Job Performance Through Training in Goal Setting," Journal of Applied Psychology. 1974, Vol 59, pp 187-191.

62. Latham, Gary P. and G.A. Yukl. "Assigned Versus Participative Goal Setting With Educated and Uneducated Wood Workers," Journal of Applied Psychology. Vol 60, June, 1971, pp 299-302.

63. Latham, Gary P. and G.A. Yukl. "Effects of Assigned and Participative Goal Setting on Performance and Job Satisfaction," Journal of Applied Psychology. Vol 61, April, 1976, pp 166-171.

64. Latham, Gary P., Terence R. Mitchell and Dennis L. Dossett. "Importance of Participative Goal Setting and Anticipated Rewards on Goal Difficulty and Job Performance," Journal of Applied Psychology. Vol 63, April, 1978, pp 163-171.

65. Latham, G.P., J.J. Baldes. "The Practical Significance of Locke's Theory of Goal Setting," Journal of Applied Psychology. 1975, Vol 60, pp 122-124.

66. Law, Joe M. "Quality Circles Zero In on Productivity at The Norfolk Naval Shipyard," Management. 1980, Vol 1, no 4.

67. Lawler, E.E. Motivation in Work Organizations. Monterey, California: Brooks/Cole, Inc., 1973.

68. Lederer, Victor. "Decision Making: Should Employees Get In on the Act?," Administrative Management. September, 1978, pp 51-62.

69. Lee, Yong J. "Why Some Circles are Doing Better Than Others," Unpublished research report, unnumbered, undated.

70. Lewis, John W. III. "Management Team Development Will It Work For You?," Personnel. July-August, 1975.

71. Likert, Rensis. New Patterns of Management. New York: McGraw-Hill, 1961.

72. Locke, E.A. "Toward a Theory of Task Motivation," Organizational Behavior and Human Performance. 1968, Vol 3(1), pp 157-189.

73. London, Manuel, and Greg R. Oldham. "Effects of Varying Goal Types and Incentive Systems on Performance and Satisfaction," Academy of Management Journal. Vol 19, December, 1976, pp 537-546.

74. McGregor, Douglas. The Human Side of Enterprise. New York: McGraw-Hill, 1960, pp 228-229.

75. Meyers, Peter. Dynamics of Personal Leadership. Harper and Row, New York, 1970.

76. Mossholder, Kevin W. "Effects of Externally Mediated Goal Setting on Intrinsic Mediated Goal Setting on Intrinsic Motivation: A Laboratory Experiment," Journal of Applied Psychology. Vol 65, April, 1980, pp 202-210.

77. Muczyk, Jon P. "MBO in a Bank and a Railroad Company: Two Field Experiments Focusing on Performance Measures," Industrial Relations Research Association Proceedings. Winter 1976, pp 13-19.

78. Nelson, Donna J. "What Motivated People Can Do", The Second Annual IAQC Conference Transactions. February, 1980, pp 37-40.

79. Nelson, Donna J. "Development of Ideas in American Management," Third Annual IAQC Conference, Louisville, Kentucky, March 1981.

80. Nelson, Joani. "Quality Circles Become Contageous," Industry Week. April 14, 1980, pp 99.

81. New Analysis, "Quality Control Circles Pay Off Big," Industry Week. October 20, 1979.

82. NBC-TV White Paper. The Productivity Crisis. September 1980.

83. Ouchi, William G. Theory Z: How American Business Can Meet the Japanese Challenge. Addison-Wesley Publishing Co., Reading, Massachusetts, 1981.

84. Pascale, Richard T., Anthony G. Athos. The Art of Japanese Management, Stanford Graduate School of Business and Harvard Graduate School of Business Administration, Simon and Schuster, New York, New York, 1981.

85. Patchin, Robert I. "Quality Control Circles," Unpublished technical report, unnumbered, January, 1981.

86. Patchin, Robert. "Remarks on Quality Circles, Northrop's Experience," Unpublished transcript of testimony before the Congressional Subcommittee on Trade, Committee on Ways and Means, October, 1980.

87. Patchin, Robert I. Comments before the Executive Directors of the IAQC, Third Annual IAQC Conference, Louisville, Kentucky, March, 1981.

88. Pauk, W.J., K.B. Robertson, and F. Herzberg. "Job Enrichment Pays Off," In L.E. Davis and J.C. Taylor (Eds.), Design of Jobs. Baltimore: Bengerin Books, 1972.

89. Perry, Bernard J. "How to Implement a Quality Circle Process," Third Annual IAQC Conference, Louisville, Kentucky, March, 1981.

90. Quality Circle, "Quality Concept Catches on Worldwide," Industry Week. April 16, 1979.

91. Rehg, Virgil R. "Quality Control Circle Reading," Unpublished research report, unnumbered, Financial Management Division, Department of Systems Acquisition Management, School of Systems and Logistics, Air Force Insititute of Technology, Wright-Patterson AFB, Ohio, January, 1980.

92. Rehg, Virgil R. Personal Interview conducted at the School of Systems and Logistics, AFIT/LS, Wright-Patterson AFB, Ohio, April 15, 1981.

93. Rieker, W.S. "What is the Lockheed Quality Control Circle Program," ASQC 30th Annual Technical Conference Transaction. June, 1976.

94. Rieker, Wayne S. "Implementing Q.C. Circles in America," IAQC, Tokyo, Japan, 1978, p C5-5.

95. Rief, W.E., DoNo Farrazzi, and R.J. Evans Jr. "Job Enrichment: Who Does It and Why," Business Horizons. February, 1974, pp 73-78.

96. Roethlisberger, F.J. Management and Morale. Cambridge, Massachusetts, Harvard University Press, pp 7-26.

97. Rosow, Jerome M. "Quality of Work Life Issues for the 1980's," Training and Development Journal. March, 1981, pp 33-52.

98. Ruh, Robert A., Kenneth J. White, and Robert R. Wood. "Job Involvement, Values, Personal Background, Participation in Decision Making, and Job Attitudes," Academy of Management Journal. June, 1975, pp 300-312.

99. Sashkin, Marshall. "Changing Toward Participative Management Approaches: A Model and Methods," Academy of Management Review. July, 1979, pp 75-86.

100. Schleicher, William F. "Quality Control Circles Save Lockheed Nearly $3 Million in Two Years," Quality. May 1977, pp 4-17.

101. Sederberg, George. "The Role of the Steering Committee," Third Annual IAQC Conference, Louisville, Kentucky, March, 1981.

102. Shuler, Randall S. "A Role and Expectancy Perception Model of Participation in Decision Making," Academy of Management Journal. June 1980, pp 321-340.

103. Sims, H.P. and A.D. Szilagyi. "Job Characteristic Relationships: Individual and Structural Moderators," Organizational Behavior and Human Performance. 1976, Vol 17, pp 211-230.

104. Steers, Richard M. "Factors Affecting Job Attitudes In a Goal-Setting Environment," Academy of Management Journal. Vol 19; March, 1976, pp 6-16.

105. Steers, Richard M. "Task-Goal Attributes, Achievement and Supervisory Performance," Organization Behavior and Human Performance, Vol 13, June, 1975, pp 372-403.

106. Susman, G.I. Autonomy at Work. New York: Praeger Publishers, 1976.

107. Swartz, Gerald E. and Vivian C. Comstock. "One Firms Experience with Quality Circle," Quality Progress. September, 1979, pp 14-16.

108. Terborg, James R., and Howard E. Miller. "Motivation, Behavior, and Performance: A Closer Examination of Goal Setting and Monetary Incentives," Journal of Applied Psychology, Vol 63, February 1978, pp 29-39.

109. Toffler, A. The Third Wave. New York: William Morrow Co., 1980.

110. Umstat, D.D. "An experimental study of the effects of Job Enrichment and Task Goals on Satisfaction and Productivity," Doctoral dissertation, University of Washington, 1975.

111. Umstat, D.D., C.H. Bell, T.R. Mitchell. "Goal Setting and Job Enrichment: An Integrative Approach to Job Design," Unpublished technical report, number LS-1-77, AFIT/LS Wright-Patterson AFB, Ohio, 1977, b. AD A041072.

112. Umstot, D.D., C.H. Bell, T.R. Mitchell. "Goal Setting and Job Enrichment: An Integrated Approach to Job Design," Unpublished research report, unnumbered, AFIT/LS, Wright-Patterson AFB, Ohio, 1977a.

113. United States Air Force, "Air Force Manual 1-1, Functions and Basic Doctrine of the U.S. Air Force," U.S. Government Printing Office, 1979, p 3.5.

114. United States Air Force, Leadership: Area Two, Book One. Squadron Officer School, Air University, Air Training Command, Maxwell AFB, 1979, p 52.

115. Walters, R.W. Job Enrichment for Results: Strategies for Successful Implementation. Reading, Massachusetts: Addison-Wesley Publishing Company, 1975.

116. White, Kenneth J. The Scanlon Plan Causes and Correlates of Success, Academy of Management Journal, June, 1979, pp 292-312.

117. Yager, Edward. "Quality Circles: A Tool for the 80's," Training and Development Journal, August, 1980.

118. Yankelovich, Skelly and White, Inc. "Corporate Priorities, The New Worker," Briefings for Management. November 16, 1977.

RELATED SOURCES

Albanese, Robert, Ph.D. Managing Toward Accountability for Performance. Howewood, Illinois, Richard D. Irwin, Inc., 1978.

Alexanderson, B. Orjan. "QC Circles in Scandinavia," Quality Progress. Vol 11, July, 1978, pp 18-19.

Amsden, Davida M. and Robert T. Amsden, editors. QC Circles: Applications, Tools, and Theory. American Society for Quality Control (ASQC), Milwaukee, Wisconsin, 1976.

_____. "QC Circles: A Challenge to ASCQ," QC Circles: Applications, Tools, and Theory. 1976.

Amsden, Robert T. and Jeffrey Bachman. "QC Circles-in the USAF?," Wright Insights. Vol 3, No 2, Wright State University, Dayton, Ohio, October, 1973.

Argyris, Chris. Personality and Organization. Harper Row, 1970.

_____. Management and Organizational Development, the Path from XA to XB. McGraw-Hill, 1971.

Austin, K. "The Tomcat Pack," IAQC Quality Circle Quarterly. 2nd Quarter, 1979, pp 33-36.

Bass, Bernard M. and V. J. Shackleton. "Industrial Democracy and Participative Management: A Case for a Synthesis," Academy of Management Review. July, 1979, pp 393-404.

Beardsley, Jefferson F. "The Quality Circle Steering Committee," IAQC Quality Circle Quarterly. 4th Quarter, 1978, pp 26-30.

_____. "Training is the Heart of the Lockheed QC Circle Program," 29th Annual Technical Conference, Transaction of American Society for Quality Control, Milwaukee, Wisconsin, 1975.

_____. "Training is the Heart of the Lockheed QC Circle Program," American Society for Quality Control (IAQC) 30th Annual Technical Conference Transactions. June 7-9, 1976.

_____. "Training is the Heart of the Lockheed QC Circle Program," Paper presented at the 1976 American Society for Quality Control Technical Conference, Toronto, Canada, May, 1976.

_____. "Beyond Efficiency to Effectiveness," Speech given to the Spring Conference of the Work Factor Associates of the West, Anaheim, California, May 3, 1974.

Berne, E. Games People Play. Grove Press, Inc., 1964.

_____. Principles of Group Treatment. Oxford University Press, 1966.

Blakely, Edward D., Davida M. Amsden and Robert M. Amsden. "QC Circle Workshop: Pareto Analysis," Paper presented at the 1976 American Society for Quality Control Technical Conference, Toronto, Canada, May, 1976.

_____. "Circles Zero-in on Trouble," Daily Pilot. July 23, 1978.

Bluestone, Irving. "Worker Participation in Decision Making," Reading in Organization. Dallas, Texas, Business Publications, Inc., 1979, pp 305-316.

Cole, E. "Learning From the Japanese: Prospects and Pitfalls," Management Review. September, 1980.

Comstock, Vivian C. and Gerald E. Swartz. "Predictable Development Stages in the Evolution of a Quality Circle," Westinghouse Electric Corporation, Baltimore, Maryland, unnumbered, undated.

Cox, B. G. "Facilitator Coordination Activities Provide Management Assessment of Quality Circle Effectiveness," Hughes Industrial Products Division, Carlsbad, California, unnumbered, undated.

Crosby, P. "Phil Crosby - Starting a New Career," Quality. June, 1979, pp 16-19.

Curley, Douglas G. "Employee Sounding Boards: Answering the Participative Need," The Personnel Administrator, May, 1978, pp 69-73.

Dachler, Peter H. and Bernard Wilpert. "Conceptual Dimensions and Boundaries of Participation in Organizations: A Critical Evolution," Administrative Science Quarterly. March, 1978, pp 1-39.

Dewar, Donald L. Quality Circles: Answers to 100 Frequently Asked Questions. Cupertino, California, Don Dewar Associates, 1979.

_____. "Management Support - A Keystone to Success," IAQC Quality Circle Quarterly, 3rd Quarter, pp 11-15.

_____. "Measurement of Results -- Lockheed QC Circles," Paper presented at the 1976 American Society for Quality Control Technical Conference, Toronto, Canada, May, 1976.

_____. "Lockheed's Quality Control (QC) Circles -- An Update," Paper presented at the 1976 Western Regional Conference, American Society for Quality Control, Costa Mesa, California, October, 1976.

Donnelly, John F. "Increasing Productivity by Involving People in their Total Job," Personnel Administration. September-October, 1971.

Donovan Michael J. "Building Management Support for Quality Circle Programs," Honeywell Avionics Division, Clearwater, Florida, unnumbered, undated.

_____. Quality Circles at Honeywell. Honeywell Avionics Division, Pinellas County, Florida, undated.

Donovan, Michael and Bill Van Horn. "Quality Circle Program Evaluation," Honeywell Inc., unnumbered, undated.

Duboin, Robert. "Industrial Workers' Worlds: A Study of the Central Life Interests' of Industrial Workers," Journal of Social Problems. January, 1956.

"Everyone is to Blame for Industrial Decline," Dayton Daily News. August 25, 1980, p 9-E.

Fein, Mitchell. Motivation for Work. American Institute of Industrial Engineers, Inc., New York, 1971.

Foulkes, Fred. Creating More Meaningful Work. American Management Association, Inc., New York, 1969.

Fox, Colin L. and James L. Koch. "The Industrial Relations Setting, Organizational Forces, and the Form and Content of Worker Participation," Academy of Management Review. July, 1978, pp 572-583.

Graen, G. "Instrumentality Theory of Work Motivation: Some Experimental Results and Suggested Modification," Journal of Applied Psychology Monograph. LIII, Part 2, 1969.

Graen, G. and Richard J. Hackman. "Corporate Profits and Employee Satisfaction: Must They Be in Conflict?," California Management Review. 1971.

Greshner, Oleg. "History of Our Quality Control Circle: Consumer Products Operating Unit - Specification Unit," Johnson and Johnson S. A. Industria E. Commercio - Sao Jose' Dos Campos, Brazil, unnumbered, undated.

Grossman, N. Bud. "Ideas Are All We Have," Time. December 3, 1979, p 89.

Harris, T. I'M OK - YOU'RE OK. A Practical Guide to Transactional Analysis. Harper and Row, 1969.

Herzberg, Frederick, et. al. The Motivation to Work. New York, Wiley, 1960.

Herzberg, Frederick. Work and the Nature of Man. World Publications, 1966.

_____. "Who Are Your Motivated Workers?." Harvard Business Review. January-February, 1964.

Hill, Cecil F. and William E. Courtright. "Quality Circles Work!," IAQC Quality Circle Quarterly. 3rd Quarter, 1978, pp 27-36.

Hitzelberger, A. J. "Quality Control Japanese Style," Talk before the Chicago Section ASQC, November 12, 1975.

_____. "A Human Approach to Motivation and Productivity -- Quality Circle," Speech given to 1979 Spring IAQC Conference, San Francisco, California.

"If Japan Can, Why Can't We?," NBC Television Documentary.

Irving, Robert R. "QC Payoff Attracts Top Management," Iron Age. August 20, 1979, pp 63-65.

Ishikawa, Kaoru. Guide to Quality Control. Asian Productivity Organization, Tokyo. Order from: Books for Asia, Limited, 30 Tat Chee Avenue, Ground Floor, Garden City, Kowloon, Hong Kong.

_____. Japan Quality Control Circles. JUSE, Tokyo, 1972.

_____. "Japanese Managers Tell How Their System Works," Fortune. November, 1977, pp 126-140.

_____. "Cause and Effect Diagram," Q.C. Circle: Applications, Tools and Theory, ASQC, 1976, pp 91-94.

Jago, Arthur G. and Victor H. Vroom. "Hierarchial Level and Leadership Style," Organizational Behavior and Human Performance. pp 131-145.

Japan Productivity Center. Productivity Movement in Japan. Tokyo, Japan: Japan Productivity Center, April, 1977.

Johnson, Richard T. and William G. Ouchi. "Made in America (Under Japanese Management)," Harvard Business Review. September, 1979.

"Joint Economic Committee Voices Dismay," Dayton Daily News. August 25, 1980, p 4.

Jongeward, D. and Contributors. Everybody Wins: Transactional Analysis Applied to Organizations. Addison-Wesley Pub. Co., 1973.

Juran, J. M. "The QC Circle Phenomenon," QC Circles: Applications, Tools, and Theory. 1976, pp 16-22.

_____. "Japanese and Western Quality - A Contrast," Quality Progress. Vol 11, 1978.

Kelly, B. "Which is it Delegation or Abdication?," Assembly Engineering. June, 1979, p 9.

Ketchum, Lyman D. "Humanizing of Work Symposium," Paper presented at American Association for the Advancement of Science Annual Meeting, December 27, 1971.

Kennedy, Senator Edward M. Address to the Urban Research Corporation Conference on the Changing Work Ethic, New York, March 26, 1973.

Konz, S. "Quality Circles: Japanese Success Story," IE. October, 1979. pp 24-27.

Kraar, L. "The Japanese Are Coming With Their Own Style of Management," Fortune. March, 1975, pp 116-164.

Krishnan, Rama. "Democratic Participation in Decision Making by Employees in American Corporations," Academy of Management Journal. June, 1974, pp 339-347.

Lee, Y. J. "QC Circle Activities As Can Be Applied in our Division," An Internal Memo. AMP, Inc., February, 1978.

Lee, Y. J. and Gerald D. Lloyd. "Implementation of a Quality Circle in a Manufacturing Organization," A paper presented at the 26th Annual Western Regional Conference of the ASQC, November, 1979.

Lloyd, Gerald D. "Management: The Japanese Touch," Newsweek. July 8, 1974, p 42.

_____. "No Miracle - Just Good Management," Quality. February, 1978, pp 22-44.

_____. Motivation through the Work Itself. American Management Association, Inc., New York, 1969.

Likert, Rensis. The Human Organization, It's Management and Value. McGraw-Hill, 1967.

_____. New Ways of Managing Conflict. McGraw-Hill, 1976.

_____. New Patterns of Management. McGraw-Hill, 1961.

Maslow, Abraham. Motivation and Personality. 2nd edition, Harper and Row, 1970.

McGregor, Douglas. The Human Side of Enterprise. McGraw-Hill, 1960.

_____. Leadership and Motivation. MIT Press, 1966.

Pabst, William R. "Motivating People in Japan," Quality Progress. October, 1972, pp 14-18.

Pavord, W. C. and T. Luczak. "New Image of Made in Japan," Intellect. April, 1978, Vol 106, pp 396-398.

_____. "Quality Circle: An Innovative Way to Get Things Done," Hughes Views. December, 1978, Vol 7, No 12.

_____. Quality Circle Quarterly. International Association of Quality Circles, 1978-1979.

_____. "A Quality Concept Catches on Worldwide," Industry Week. April 16, 1980, p 125.

Post, James E. and Lee E. Preston. "The Third Managerial Revolution." Academy of Management Journal. September, 1974, pp 476-486.

Rehg, Professor Virgil R. "Introduction to Quality Circles," Air Force Institute of Technology, AFIT/LS, Wright-Patterson AFB, Ohio, April 14, 1980.

_____. "What Are The Tools of the QC Circle," QC Circle: Application, Tools and Theory, ASQC 1976, pp 95-104.

_____. "Quality Control Manual," Unpublished research report, unnumbered Financial Management Division, Department of Systems Acquisition Management, School of Systems and Logistics, Air Force Institute of Technology, Wright-Patterson AFB, Ohio.

_____. "QC Circles," Air Force Institute of Technology, Wright-Patterson AFB, Ohio, March 4, 1978.

_____. "Want to Improve Productivity? Try QC Circles," Unpublished research report, unnumbered, Air Force Institute of Technology, Wright-Patterson AFB, Ohio, October 8, 1979.

Rieker, Wayne S. "Management's Role in QC Circles," Quality Control Circles Inc., Saratoga, California, unnumbered, undated.

_____. "Quality Control Circles -- Development and Implementation," American Society for Quality Control (ASQC), 29th Annual Technical Conference Transactions. May, 1975, p 450.

_____. Increasing Motivation, Productivity and Creativity Through Quality Circles. Anaheim, California, W. S. Reiker, Inc., January, 1979.

_____. "What is the Lockheed Quality Control Circle Program," ASQC 30th Annual Technical Conference Transaction. June, 1976.

_____. "Quality Control Circles -- Development and Implementation," Paper presented at the 1975 American Society for Quality Control Technical Conference, San Diego, California, May, 1975.

Rubinstein, Sidney P. "Participative Management. New Approaches to Human Work Resources," Professional Engineer. December, 1972, pp 17-21.

Seminara, J. L. "Quality Control Circle Pilot Management Program," Transactions, Western Regional Conference, American Society for Quality Control (ASQC). October, 1975, p 162.

Sherwin, Douglas S. "Strategy for Winning Employee Commitment," Harvard Business Review. May-June, 1972.

Stone, P. B. Japan Surges Ahead, The Story of an Economic Miracle. Praeger, 1969.

Taylor, James C. et. al. The Quality of Working Life: An Annotated Bibliography. Los Angeles: University of California at Los Angeles, 1973.

Teague, Burton. "Can Workers Participate in Management -- Successfully?," The Conference Board Record. July, 1971.

Thatcher, R. "New Secret as Old as Time," Industry. March, 1972.

_____. "The U.S. Work Ethic: Dead or Alive?," Iron Age. January 4, 1973, pp 90-91.

Vroom, Victor H. Work and Motivation. New York: John Wiley and Sons, Inc., 1964.

Walton, R. E. "Explaining Why Success Didn't Take," Organizational Dynamics. September, 1975.

Warzon, Gloria J. "Quality Committment - A Search For Excellence," Lincoln National Life Insurance Co., Fort Wayne, Indiana, unnumbered, undated.

White, Kenneth J. "The Scanlon Plan Causes and Correlates of Success," Academy of Management Journal. June, 1979, pp 292-312.

Wilson, N. A. B. "The Quality of Working Life: A Personal Report to the NATO Committee on Challenges of Modern Society," 1971.

Yager, E. "Examining the Quality Control Circle," Personnel Journal. October, 1979, pp 682-684.

Zimmerman, Kent D. "Participative Management: A Reexamination of the Classics," Academy of Management Review. October, 1978, pp 896-901.


DAT
ILM